AUGUST 3, 1998 VOLUME 15, NUMBER 31

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

Global Gambit

British Telecom's Iain Vallance will lead the $10 billion AT&T-BT voice/data service venture. Page 23.

Most comprehensive network outsourcing contracts last at least three to five years and are worth big bucks. They are long-term commitments that have to be designed to weather the inevitable business and technology changes that will happen along the way.

No matter where you are in an outsourcing agreement, you need to work at keeping the relationship strong. Turn to page 35 for tips on forming a harmonious union with an outsourcer that will stand the test of time.

BELL ATLANTIC + GTE

Competition takes a hit

Critics say Bell Atlantic/GTE merger flies in the face of the telecom act and could limit users' service choices.

By Tim Greene, Sandra Gittlen and Denise Pappalardo

So this is competition?

Bell Atlantic and GTE have agreed to a $53 billion merger that will create the largest local telecom carrier in the U.S., part of a runaway trend that is leaving the industry with fewer but bigger players.

Proponents contend this trend will spawn supercarriers that can offer a full portfolio of services unheard of since the breakup of the Bell system — everything from local to international voice to video and data and Internet access and wireless support.

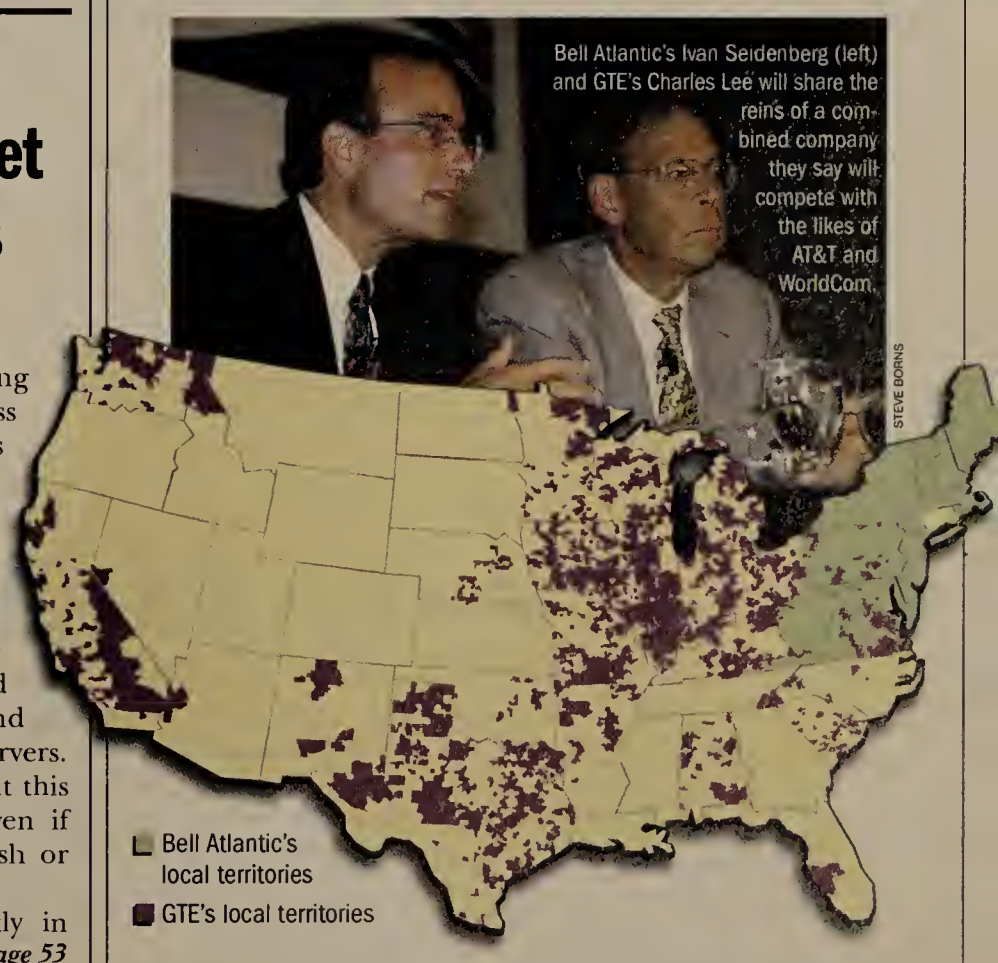
But critics say these megadeals fly in the face of what Congress had in mind when it passed the Telecommunications Reform Act of 1996, which was meant to increase competition, spur innovation and lower rates.

The mergers among GTE and the seven regional Bell operating companies, which together own the bulk of local facilities in the U.S., are effectively decreasing the number of local-loop options, critics charge.

"If competition means choice, you can't take eight, *See* **Bell Atlantic/GTE,** *page 52*

ALL OVER THE MAP

A combined Bell Atlantic/GTE would have local assets in 81 of the top 100 U.S. markets but wouldn't increase the choices customers have for local service.

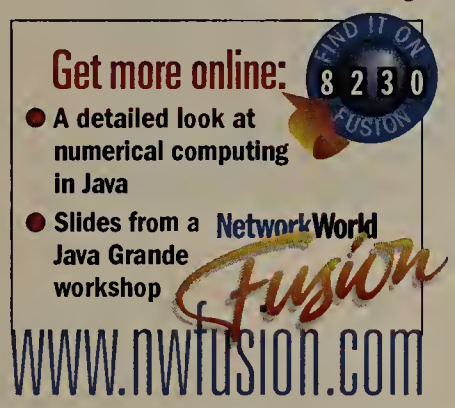


Brainy users pushing super Java

Java Grande Forum calling on Sun to boost Java's ability to handle complex apps.

By Ellen Messmer
Palo Alto, Calif.

Sun Microsystems this week will meet here with a group of the brainiest academics and industry gurus in the high-speed computing field, hoping to find a way to overcome barriers to using Java in advanced engineering and math-intensive computing.



James Gosling, the Sun engineer who invented Java, has quietly acknowledged the programming language's limitations in numerics. The group is pushing for changes in Java so it can be used in aerospace engineering, car design and scientific modeling.

Calling itself the Java Grande *See* **Java,** *page 53*

Internal politics plague net directory planners

By Paul McNamara
Colorado Springs

Consolidating directories is much like closing military bases: Virtually everyone agrees it should be done, but politics get in the way any time anyone actually tries.

"Any big directory project is 80% politics and team-building, and 20% technical," said Gary Rowe, an analyst with The Burton Group consultancy, which last week hosted Catalyst Conference '98 here.

The gathering of customers and vendors focused on a variety of enterprise directory infrastructure issues. The topics *See* **Burton,** *page 12*

NEWSPAPER
011

IBM building bulletproof net storage tools

By Marc Songini
Yorktown Heights, N.Y.

When it comes to storing and backing up data across networks, IBM researchers are taking a "divided we stand" approach.

Big Blue is working on software called Secure Distributed Storage (SDS) that's designed to divide files, security keys and other data into pieces and distribute them across servers. The goal is to ensure that this data can be accessed even if one or more servers crash or are hacked.

The software, currently in *See* **IBM,** *page 53*

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VIVID VISION

New Newbridge President Alan Lutz plans to pump up the company's VIVID line of enterprise network switch-routers. Page 10.

NETWARE LOCK DOWN

NetWare 5.0 will include a handful of Internet security features, including a way to issue and manage digital certificates. Page 13.

KING OF THIN

Citrix has been riding high since Microsoft licensed Citrix's multiuser Windows code. Can President Mark Templeton keep up the momentum? Page 16.

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This Week

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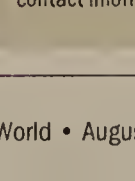

Water Cooler. News Editor Doug Barney looks at marketing run amok. Some products just aren't worth the hype the marketing departments lather up. Look at network computers or even Java. Is Sun's Jini next up on the flame-out list? **DocFinder: 8234**

Telecommunications. What does the Bell Atlantic/GTE deal mean to you? Take our insta-poll on the acquisition and see how others have voted, then expand on your thoughts in our merger forum. **DocFinder: 8231**

Help Desk I. A reader is having problems getting Windows 95 clients equipped with Microsoft's NetWare client to consistently print via a NetWare 3.1x server. Any suggestions? **DocFinder: 8235**

Help Desk II. Another reader faces a perplexing problem with an RRAS multilink connection: Modems keep dropping out, reducing the available bandwidth. Have you solved this? **DocFinder: 8236**

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News briefs, August 3, 1998

Paul Allen grows own cable access world

Bill Gates isn't the only Microsoft founder with a knack for making news. Co-founder Paul Allen last week took a big step toward becoming a cable and remote access king. Allen paid $4.5 billion to buy Charter Communications, the 10th-largest cable operator in the U.S.

Microsoft *co-founder Allen buys Charter.*

The move is just the latest development in Allen's "Wired World" strategy, which he said aims to capitalize on the merger of high-bandwidth data channels, PCs and the availability of "valuable" content. The company will be integrated with Marcus Cable Corp., the Dallas cable operator in which Allen recently acquired limited partnership interest. The merged cable operator will be the seventh-largest in the nation, with 2.4 million customers, according to Marcus and Charter executives.

Java security glitch hits Netscape

School may be out for the summer, but researchers at Princeton University's Secure Internet Programming Lab aren't goofing off.

The lab last week found a security flaw in Sun's Java programming language that lets malicious applets disable security controls in Netscape Navigator 4.0 and 4.5. After incapacitating the controls, such applets could read, modify or delete data on the target machine.

Netscape officials said the problem has been solved in Netscape Communicator 4.5 Preview Release 1 and will be fixed in the upcoming maintenance release of Communicator 4.0x, which will be available in the next several weeks. No customer incidents have been reported to Netscape.

Cyberburglar bounced

The Federal Bureau of Investigation last week arrested Kenneth San Nicolas, 18, of San Diego for allegedly stealing services from PageNet, a wireless paging service provider in Dallas. The teen-ager's arrest occurred after an FBI investigation spanning several months.

A PageNet internal Systems Integrity Group investigation turned up evidence that San Nicolas was creating fraudulent and unauthorized voice mail boxes and paging accounts on the company's network. PageNet then handed this evidence over to the FBI. The company estimates it lost more than $1 million in telecommunications costs due to San Nicolas' activities.

Lucent snaps up MassMedia

Lucent Technologies last week continued to fill its high-tech shopping bag with acquired technologies. This time the company bought MassMedia Communications, a software maker that manages connections across data, voice and video networks. Financial terms of the deal were not disclosed.

Lucent already uses MassMedia software on its PacketStar ATM access boxes to link ISDN and ATM networks. Now Lucent is evaluating which of its other products MassMedia software might complement.

Foundry founders to go with IPO

While executives at most of the high-profile Gigabit Ethernet start-ups swore their companies weren't for sale, a good number of these companies did eventually sell out. One exception has been Foundry Networks, which last week confirmed that it plans to make an initial public offering in the next nine to 12 months.

That'll be one way for the company to differentiate itself from the likes of Rapid City, Prominet, YAGO and others that have been acquired over the past couple of years.

Glitch dogs e-mail security

Microsoft and Netscape scramble to develop patches for latest security breach.

By Andy Eddy

Just when you thought it was safe to use e-mail.

Researchers have discovered a security hole in popular Microsoft and Netscape e-mail programs that could cause a recipient's mail application to crash or let a hacker execute malicious events inside the PC.

The problem, discovered by researchers at the Oulu University Secure Programming Group (OUSPG) in Finland, reportedly affects Microsoft's Outlook 98 and Outlook Express e-mail programs and Netscape Communications' Communicator client software. An OUSPG spokesman declined comment in an e-mail to *Network World*, deferring to other knowledgeable parties "until the dust has settled."

Not all versions of the software are vulnerable to this defect. Microsoft confirmed that Outlook 98 for Windows 95, 98 and NT is affected, as is the Outlook Express included with Internet Explorer 4.x for Windows 95, 98 and NT, Solaris and Macintosh. Netscape established that Communicator 4.x for Windows 3.1, 95, 98 and NT is susceptible, but doesn't believe the vulnerability extends to its Macintosh and Unix software.

The receipt of an e-mail message or newsgroup message with a long file name in an attachment triggers the bug. The message may trigger the display of an error message, crash the mail software or crash the user's computer. Code strategically placed in the e-mail message can be executed at the chip level, circumventing the computer's security settings. The scope of such an attack can range from minor to extremely destructive — much like any virus or Trojan horse, it can be programmed to deliver passwords to the attacker, delete files from a hard drive or cause any number of maladies.

Some other mail packages don't face this security threat. For example, Eudora e-mail software, made by Qualcomm, has been tested and doesn't fall victim to the same problem. Matthew Parks, product line manager for Eudora, said that if an attachment with a file name over a certain number of characters is received, Eudora truncates it to a maximum number allowed by the operating system, which eliminates this security risk.

"I would assume that similar type of code will be put in the other companies' programs," Parks said.

Microsoft and Netscape acknowledge the potential seriousness of the problem. However, each company said there has been no reports of this security hole being capitalized upon. Parks noted that it would require a proficient hacker to take advantage of this flaw.

"I wouldn't be surprised if there are some people toiling away at this. But from what I understand, it's not a trivial thing to create something to exploit this," Parks said.

Despite that sentiment, at least one user thought the security flaw was serious.

"In short, this bug is the worst thing that can happen. It affects the end user, so it's much harder to fix, and it makes an infamous "Good Times" virus possible," said Vytis Fedaravicius, system administrator at Omnitel, a telecommunications company in Vilnius, Lithuania. Good Times is a legendary hoax that, via an e-mail virus, trashes a user's computer when a mail message with the subject of "Good Times" is opened.

The companies involved are clambering to solve the problem and issue fixes to the public. Microsoft claims it should have a complete set of patches across the versions affected shortly.

Netscape said the firm has a fix currently in testing that should be available to its users within two weeks. ■

MESSAGING MENACE

It's an insidious threat — incoming e-mail that could crash your messaging program and put your computer's security at risk. Here's how this "long file name" problem can unfold:

1. A user sends an e-mail message containing a file attachment with a long file name — potentially to hundreds or thousands of recipients.

2. On the receiving end, the attachment can overload the buffer of the mail software on an end user's computer and crash the mail program. Worst of all, the mail message doesn't even need to be opened for this to happen.

3. Additionally, malicious code contained in the e-mail attachment may execute on the user's computer, with wide-ranging effects, from cosmetic and annoying to destructive and debilitating.

Patching things up

Here's how Microsoft and Netscape are addressing the "long file name" problem.

- Microsoft last week offered a patch for its Outlook and Outlook Express clients the company later claimed was incomplete; Microsoft plans to have a fully working patch shortly. For more information, visit **www.microsoft.com/security/bulletins/ms98-008.html**
- Netscape is planning to make a patch for its Communicator client available within two weeks. For more information, visit **http://home.netscape.com/products/security/resources/bugs/longfile.html**

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EnCommerce simplifies Java security

By Ellen Messmer
Santa Clara, Calif.

Web electronic commerce software provider enCommerce last week boosted its Java-based Web security software by adding single sign-on authentication and an improved method for managing user access to network resources.

With getAccess 3.0, network managers can set up users to log on once to a Web site using a password, a dynamic-password token or digital certificates. At the same time, users can receive authorization to access restricted servers, Web pages or even Common Object Request Broker Architecture (CORBA)-based services without having to authenticate themselves over and over again. Specifically, getAccess 3.0 supports hardware-based, one-time password tokens from Secure Computing and Security Dynamics.

This single sign-on feature is important to Prudential Insurance Co. of America, which will use getAccess 3.0 to let its customers access account information via the World Wide Web. "We're also going to be using this on our intranet, where we have multiple passwords and IDs today," said Michael Mandelbaum, Prudential's vice president of IS.

Prudential suggestions

As a beta user, Prudential influenced enCommerce to equip getAccess with HTTP session management to exert better control over user sessions so that the administrator can lock out any user or group of users in real time.

With the current getAccess version, 2.2, it's difficult to implement any termination of a user session, acknowledged Alberto Yepez, president and CEO of enCommerce. Yepez noted, "That's because without session management, [administrators] can't control what happens between the browser and server."

Available for HP Unix, Sun Solaris, NT and now AIX, getAccess 3.0 contains three software components: an access server, registry server and the getAccess administration module.

The access server sits on any Web server and requires the user to authenticate his identity so the registry server can determine what resources the user is allowed to use.

EnCommerce's Alberto Yepez *wants to give users better control over server-to-browser sessions.*

Customers can deploy Sybase, Oracle or MS-SQL Server databases as registry repositories to store user information and Web authorization. GetAccess is based on the Lightweight Directory Access Protocol, which would allow the program to take advantage of user authentication information if the network manager stored the data in an LDAP-based directory.

Yepez said that getAccess 3.0 will have more finely grained access-management controls for Web servers or CORBA-based resources than the previous version. "For instance, you'll be able to meter the number of sessions the user is allowed to have within a specific time period," said Yepez. This would be useful for firms charging by the minute for access to information or services.

Available in September, getAccess 3.0 will cost $25 per user or $25,000 for unlimited use.

✆ enCommerce: (408) 733-7800

USER EXCELLENCE AWARDS

Call for entries

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Winners will be profiled in our year-end Power Issue and will be honored in an awards ceremony at the ComNet conference in Washington, D.C. next year.

The competition is open to end-user organizations as well as vendors, service providers and consultants that want to enter on behalf of their customers and clients (with proper approval, of course).

For entry details, go to www.nwfusion.com/media lounge.

The entry deadline is Sept. 1, 1998.

Good luck.

New Compaq server boosts performance, capacity

By Nancy Weil and Marc Songini
Boston

Looking to offer data center customers a server with high performance and improved capacity, Compaq Computer Corp. Tuesday will unveil the Proliant 1850R box to replace the venerable 850R server.

The 1850R platform includes a World Wide Web server, an electronic commerce server and a firewall server.

For enterprise users, 14 of the 1850R servers can be mounted in a rack to save space, and provide more power than the product line has offered in the past.

Compaq designed the new server after the company received feedback from users of the Proliant series and kept hearing "large enterprises are more and more constrained on the space they have for servers," said Mary Christ, director of product marketing for Compaq's Internet solutions business unit.

Although the configuration of the 1850R will vary, a typical configuration includes a 400-MHz Pentium II processor, mirrored RAID and 64M bytes of 100-MHz SDRAM error-correcting code memory. The box will also have 512K bytes of Level 2 cache, two 4.3G-byte hot-pluggable wide Ultra SCSI-2 hard disk drives and four full-length slots. The price on that configuration is $6,100.

The 1850R servers can be serviced while still in the rack and allow for tool-free cover removal. IS managers told Compaq they wanted easier servicing as well, according to Mukund Ghangurde, manager of product marketing for servers at Compaq.

ActiveAnswers

The server is part of the hardware component of Compaq's ActiveAnswers program, which was introduced in early July. The program is geared to help IS departments more effectively plan, deploy and implement software, including SAP R/3 and Web-based systems, and determine hardware needs for those applications.

The new server got the thumbs up from one beta tester. "You've got a tremendous amount of power with a small form factor," said Andy Shulman, manager of messaging and remote accessing services for WorldCom Advanced Networks, a managed service provider based in Columbus, Ohio.

The machine has the muscle of Compaq's higher end enterprise servers, Shulman said. His company has been using the 1850R for remote access and messaging operations.

"I think simplicity is really the key to this," said James Gruener, analyst with Boston-based consultancy Aberdeen Group. Companies that want to set up a Web server prefer to buy an offering with all the pieces in place instead of assembling separate components on their own, he said.

In related Compaq news, the company last week announced a transaction processing tool called Portable TP, which will let users write an application once on Windows NT, using the Microsoft Transaction Server (MTS), and deploy the application on Unix, Windows NT and Digital OpenVMS platforms with no recoding required, according to Compaq.

Portable TP 1.0 for Windows NT allows users to develop MTS applications quickly, said Art Zina, program manager at Compaq. With Portable TP 1.0, managers do not need to learn other platforms or APIs, he added.

Portable TP 1.0 includes X/Open, a standards-based high-level language used in accessing data and developing transaction processing applications for different platforms and communication environments, Zina said. Available now, the product costs $385.

Also announced today, Application Optimizer 1.1 for Windows NT enhances application performance, system resources and the number of users supported on Windows NT, Microsoft Internet Information Server and MTS. Optimizer is a plug-in that allows IS managers to increase NT's application performance, which suffers when too many users try to access a database simultaneously. Optimizer increases throughput up to 22% and reduces memory usage for MTS applications up to 33%, Compaq said.

Application Optimizer, available now, is priced at $450.

For more information, Compaq can be reached at (281) 370-0670.

Weil is a correspondent with IDG News Service's Boston bureau.

CORRECTION

An article "Simplicity is the Allure of electronic commerce offering" in the July 27 issue incorrectly identified Commence Corp. of Shrewsbury, N.J. The company can be reached at (800) 688-7080.

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Newbridge to revive VIVID line

New President Alan Lutz taking aim at enterprise networks with switch-routers.

By Tim Greene
Kanata, Ontario

If Newbridge Networks had a company motto, it might be: If at first you don't succeed, try, try again.

After repeated attempts to breathe life into its enterprise switching line, Newbridge and its new president, Alan Lutz, are trying to grab some of those big corporate network dollars that have eluded the firm in the past.

Part of the strategy calls for redoubling the effort to sell the company's VIVID switch-routers into enterprise environments. While the product family has been around for five years, last year a spokesman said VIVID accounted for less than 5% of the company's total sales.

"VIVID is a dismal failure. Why do they feel they have to be successful in the enterprise? Cisco and Bay own it," said Raymond Keneipp, principal analyst for carrier infrastructure at Current Analysis in Sterling, Va.

He said Newbridge has been more successful selling to carriers than to corporate users, and that carriers represent the biggest potential for more sales.

With its new push, Newbridge won't make a run at the mid-level enterprise, where the company acknowledges Cisco and Bay dominate.

Lutz's plan will target high-end enterprise customers who want to control their own networks and also who want to specify quality of service across the network for groups, individuals or applications.

That will increase sales to enterprises, but even so, Lutz's overall sales targets would have enterprise sales drop as a percentage of the company's total revenue from 30% to 20%. Enterprise sales are targeted to decline because Newbridge expects exponential growth in sales to upstart carriers, said Stu Aaron, Newbridge assistant vice president for enterprise marketing.

Newbridge's *Lutz has split the company in three.*

This is the company's third attempt to revive VIVID, which the company introduced in 1993 and started shipping in 1995. Last year, Newbridge bought UB Networks in an effort to find new customers for VIVID products, and fill in its LAN product line with UB's switching hubs. The plan was to boost enterprise customer sales from 30% to 50%. That hasn't happened.

Now with Lutz on board, the enterprise and VIVID are in the spotlight again. Lutz also split the company into three product groups: carrier switching, access, and IP and internetworking.

Lutz has also set the goal of boosting Newbridge sales to $5 billion by 2002. Newbridge revenue last year was $1.6 billion.

Lutz did not rule out selling the company in the future, but he did say it was not being shopped around now.

Tim Smith, an analyst with Dataquest in San Jose, Calif., said the new split of product lines sounded as if the company was planning to sell off neat segments. For example, the ATM WAN switching division might be attractive to Lucent, he said.

Lutz is making his presence known and is trying to whip the company into shape. He is letting an ad hoc management group report directly to him with suggestions to make things run smoother within the company. Dubbed the Phoenix Task Force, the group was formed before Lutz came on board.

"The organization is keen to move forward in a different style in an attempt to stake out a significantly larger place in the marketplace," Lutz said.

The three product groups Lutz formed will help do that, he said. Each will run its own research and development, and product marketing.

Each product group will also interact on its own with Newbridge affiliate companies, independent spinoff companies whose products augment Newbridge product lines. "Our decision to move from a single large R&D structure to three smaller, more nimble product groups with well-defined and highly focused business charters will enhance our focus on market segments that we can defend vigorously," Lutz said.

Lutz said he also plans to appoint an executive vice president of worldwide marketing, a position the company never had. As a result, regional marketing for the same products differed and created confusion among international customers who might deal with more than one Newbridge marketing region, Current Analysis' Keneipp said.

Lutz will take on the new job until he can find a replacement from outside the company.

Despite Lutz's initiatives, some observers think Chairman and CEO Terry Matthews will run the show. "It's still Terry Matthews' company," said Rosemary Cochrane, an analyst with Vertical Systems Group in Dedham, Mass. ■

Lotus to end development of Notes/Domino for NetWare

By Nancy Weil
Cambridge, Mass.

Lotus is ceasing the development of Notes/ Domino groupware for Novell's NetWare operating system.

Lotus decided to halt work on NetWare because of a lack of interest among customers in using the platform for e-mail and groupware applications, a company spokesman said.

Customers increasingly are moving to Windows NT and Unix as platforms for collaborative applications, the Lotus spokesman said. However, Lotus does not publicly disclose its breakdown of NT vs. NetWare customers.

Lotus and Novell continue to discuss issues related to NetWare, "and it's always possible the decision could be revisited sometime in the future," the spokesman said.

Lotus' decision may burden the company's cc:Mail users, many of who are faced with upgrade decisions in order to attain Year 2000 compliance. Choosing Notes 5.0, which Lotus has encouraged, would also necessitate a move away from NetWare. Novell will undoubtedly try to sell these shops on GroupWise, the company's own messaging and collaboration software.

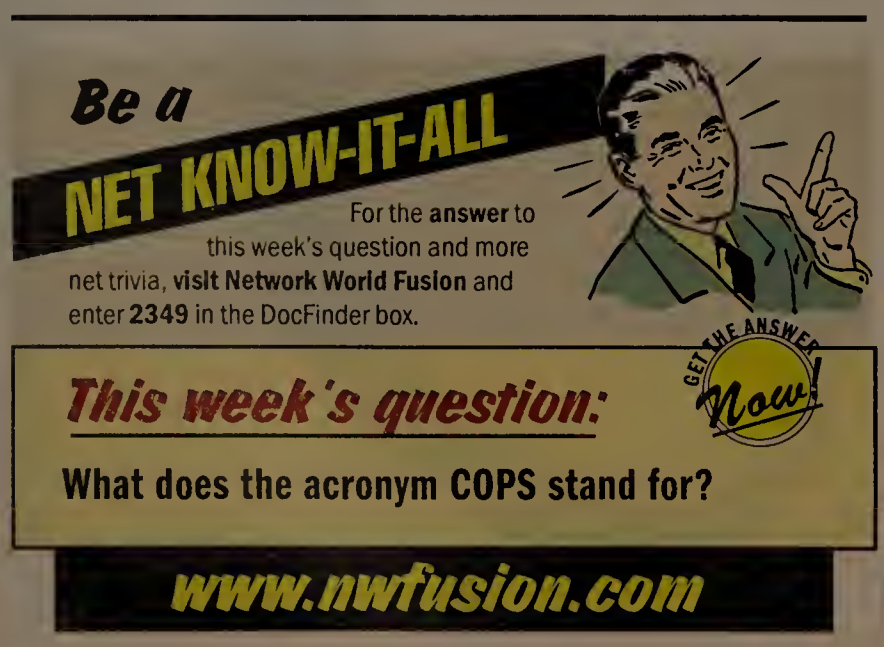
In the meantime, Lotus will continue to support NetWare while the 4.6x version of Notes/Domino is current, which will be for at least four more years, the spokesman said. "During that period, we'll have time to work on a number of tools to facilitate any migration customers want to make [to other platforms]," he said of those now using Notes on NetWare.

Whatever support Lotus offers, the decision to halt development of Notes/Domino for NetWare does not bode well for the Novell operating system, said analyst Dan Kusnetzky of International Data Corp., a market research firm in Framingham, Mass.

However, he noted that last year NetWare shipped almost a million units, indicating that the operating system is far from dead.

"It's kind of surprising that Lotus would walk away from a quarter of the market," he said.

Weil is a correspondent with IDG News Service's Boston bureau. IDG News Service correspondent James Niccolai contributed to this report.



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Cisco buys voice switch maker Summa Four

By Jim Duffy
San Jose, Calif.

Stocking up on voice armaments for the IP convergence battle, Cisco Systems last week said it signed a definitive agreement to acquire publicly held Summa Four of Manchester, N.H., for $116 million.

Summa Four is a maker of programmable switches — its VCO family — for service provider networks. Cisco said Summa Four's switches will enable the routing giant to offer telephony applications to new and existing service providers, which in turn can offer new and enhanced voice services to users over IP networks.

PROFILE: SUMMA FOUR

Founded: 1976

Customers: RBOCs, the top three U.S. interexchange carriers — including WorldCom and AT&T — Singapore Tel, Telstra in Australia, British Telecom, Hong Kong Tel and Telefonica in Spain.

Products: The VCO line of switches, which serve as components of service nodes or as core network transport switches.

Financials: Revenue of $42 million, net loss of $2.7 million for fiscal year 1998.

Management: Robert Degan, president and CEO; Todd Hasselbeck, vice president, Worldwide Sales; Philip Coates, vice president, International Sales; John Shaw, vice president, Business Development and Strategy.

These switches are used today for basic call switching, as well as for delivering voice mail, calling card and voice-activated dialing services over circuit-switched networks.

With this acquisition, Cisco has one more weapon in its arsenal to combat telecom heavyweights Lucent Technologies and Nortel in the voice-over-IP arena. With the Summa Four equipment, Cisco will attempt to entice service providers to purchase Cisco voice switches by convincing them that they can quickly deploy new and enhanced software-based services.

To do this, Cisco said that it will provide application developers with an "open services environment" for writing software for circuit- and packet-switched networks.

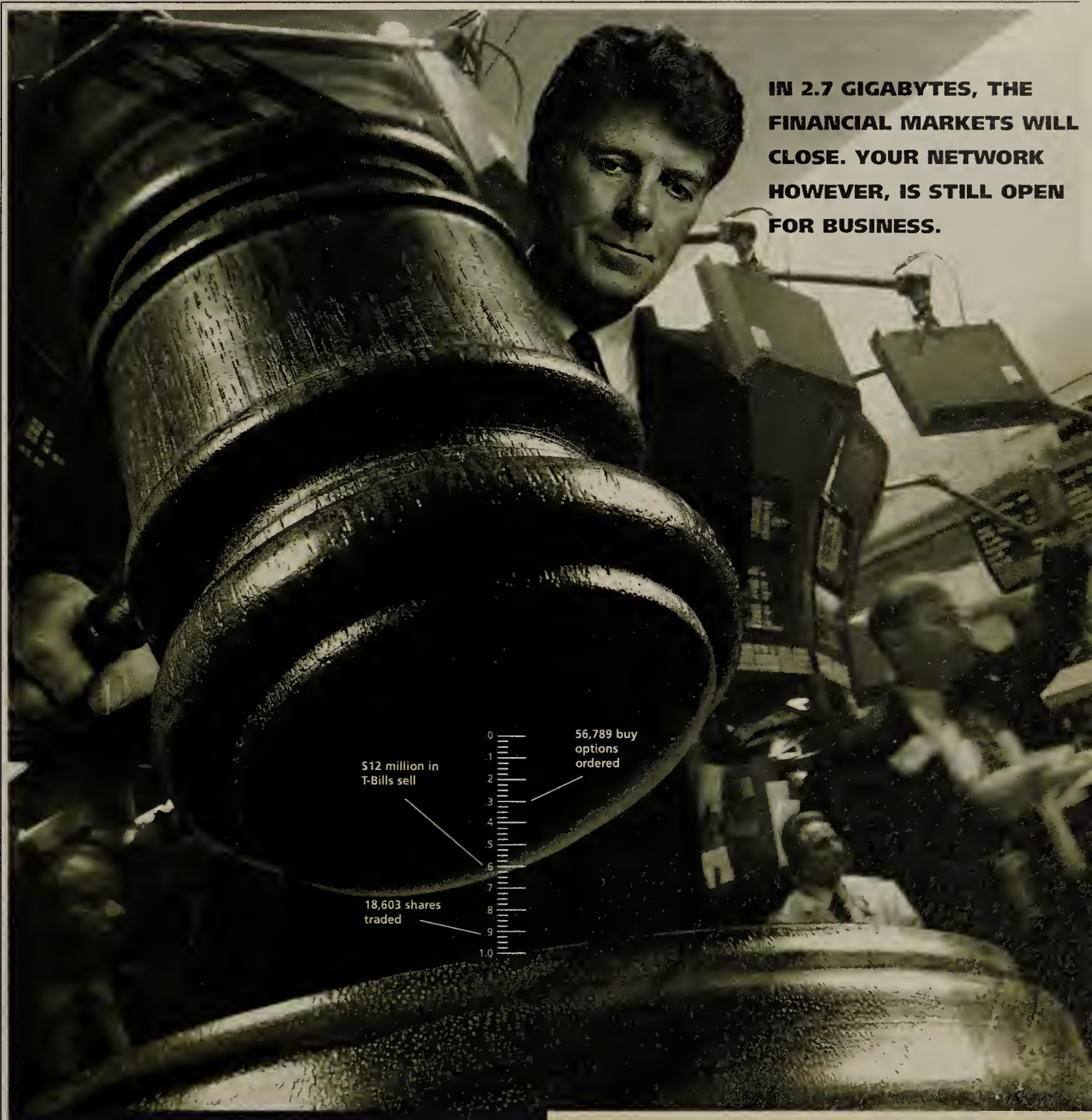
Cisco said it will also expand Summa Four's existing relationships with application developers and help them extend their service platforms to voice-over-IP networks.

According to Cisco, this will enable carriers to select from more than 50 application developers that have built an array of voice packages based on Summa Four's switches.

"It's an excellent acquisition," said Frank Dzubeck, president of Communications Networks Architects, a consultancy in Washington, D.C. "Summa Four has been around awhile, it has an embedded base of customers and it has technology that can be made portable. Cisco doesn't have this expertise."

Summa Four, however, will not allay fears that Cisco cannot ensure the reliability of global voice infrastructures, Dzubeck said (*NW,* July 20, page 27).

"This issue has to do with voice processing capabilities," Dzubeck said. "Buying Summa Four will give Cisco additional knowledge, but it's not going to address any of the concerns at all." ■



To outsiders looking in, it is a ballet of chaos and frenzy with global consequences. On the floor of any major stock exchange, the volume of information transactions fluctuates wildly as gigabytes of data circulate worldwide within fractions of a second. As the demand for information peaks, one issue stands alone – can the network handle the volume? Financial sector businesses require an information infrastructure that is ready for anything. It is probably the most important investment they'll ever make. It's also why they choose Newbridge to deliver their network.

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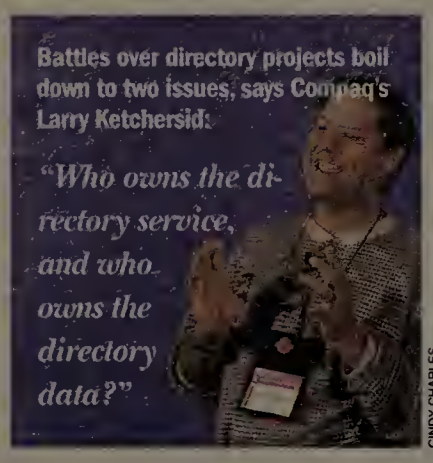
Burton

Continued from page 1

included how best to stem the unrelenting proliferation of directories, how to eliminate those deemed expendable and how to link what's left to minimize the expense of duplicative data maintenance.



CINDY CHARLES

Fueled in part by mergers and acquisitions, today the average IT environment has 181 different directories, according to industry surveys. One shop reported an astronomical 1,530. Attempts by enterprise directory strategists to corral such expensive sprawl are often hampered by legitimate disagreements and internecine squabbling over data ownership, naming conventions, directory tree designs and security issues.

The battles generally boil down to two questions, according to Larry Ketchersid, director of enterprise computing at Compaq: "Who owns the directory service, and who owns the directory data?"

"The directory service is infrastructure, and IT or your operations organization should own that service and own the management of that service," Ketchersid said. "The data is where the big fight comes in."

Real concerns

Much of that wrestling occurs over legitimate differences about who has ultimate control over particularly sensitive directory data, such as that found in legal and human resources departments.

One conference attendee cited an incident in which the new job titles of recently promoted employees were accidentally published in a directory-based company white pages system before the company's managers had an opportunity to notify employees of their promotions. The company's human resources department wasn't too happy about this incident, he said.

Other reluctant converts to enterprise directories are simply being territorial.

"That is a very human thing, and we have it," said Keith Hazelton, IT architect at the University of Wisconsin-Madison, which is in the early stages of an enterprise directory project. "The first instinct there is a good one, it's a survival instinct; you want to control [the data], you need to do your job.

Behavior modification

"It only becomes negative when it becomes a reflex, which has happened in some cases," Hazelton added. "However, reflexes can be unlearned."

Planning and persuasion are the keys to minimizing such reflexive opposition, experts said. They recommended:

- Bringing a wide and varied collection of interested parties into the planning process from the start, particularly in far-flung organizations with multiple business units and network infrastructures.
- Establishing an accurate inventory of existing directories and a clear understanding of the methods and motivations for managing them today.
- Nailing down a concrete business justification for consolidating directories that spells out the financial and operational benefits.
- Getting the top brass to accept and push the plan.

According to the strategists, vendors also need to provide directory products that offer more reliable interoperability and better ways to define directory responsibilities within large organizations.

"It seems to us that one of the ways to solve the problem [of territoriality] is through [products] that allow highly granular, distributed data ownership," said Durwin Sharp, global technology architect for Exxon Computing and Networking Services.

Such capabilities would, for example, allow a human resources department to retain exclusive control over sensitive personnel data while ceding responsibility for more mundane employee information to a centralized directory.

Selling and launching an enterprise directory project is never easy, the experts agreed. But they said the potential rewards are great, as are the costs of doing nothing.

"The fact that [some] data is being entered in 50 different places may not be a problem if you're one of those 50 departments entering the data," The Burton Group's Rowe said. "But it sure is a problem from the company's perspective." ■

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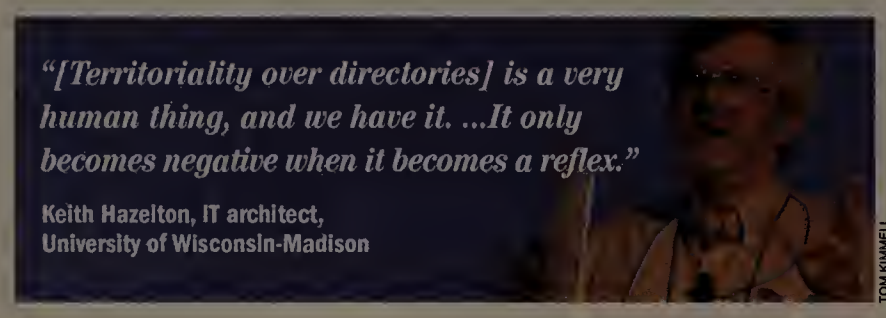


TOM KIMMELL

IBM-Lotus to distribute free 'Net security code

Security jitters stunting the growth of electronic commerce should be calmed considerably by an IBM-Lotus move to seed the marketplace with free digital certificate source code.

That is the assessment of corporate customers and industry experts who heard IBM-Lotus announce the giveaway at last week's Catalyst Conference '98. The conference, sponsored by The Burton Group consultancy and the Network Applications Consortium, also featured product and partnership announcements from Netscape, VeriSign and Isocor.

By the end of the month, IBM-Lotus will make available a reference implementation of a pending IETF standard called Open Public Key Infrastructure, commonly known as PKIX. The standard defines how products issue, validate, revoke and renew digital certificates, which are used to assure the security of Internet transactions and messages.

Standards-based PKIs are considered a crucial step toward building corporate and consumer confidence in the security and reliability of Internet commerce. IBM-Lotus executives hope that their code release will allow other software vendors to produce interoperable PKIX-compliant products easily and quickly.

The PKIX reference implementation will be posted to a Web site hosted by the Massachusetts Institute of Technology (www.mit.edu). The technology will also be integrated into Lotus' Domino 5.0 server, which is expected to ship later this year.

The IBM-Lotus initiative was met with widespread approval at last week's conference, which focused on the future of network infrastructure.

"This could be a real catalyst for getting a network security infrastructure in place," said Harold Albrecht, an applications infrastructure architect at Carolina Power & Light in Raleigh, N.C.

Phil Schacter, an analyst with The Burton Group, agreed.

"It will accelerate progress toward getting lots of these [PKIX] implementations from different vendors," he said. "This is going to take away roadblocks [to widespread PKI adoption], and IBM is probably going to do quite well."

According to Schacter, however, "dissension in the PKIX community about the best way to do certain things" is likely to present implementation challenges for vendors and may slow widespread use of the technology.

"We're probably not going to see commercial products until maybe the second half of next year," he said.

Also at the conference, Netscape and VeriSign said they will expand their PKI-related dealings with one another. Among other things, this effort will allow Netscape Certificate Server users to issue and manage digital certificates as part of the VeriSign Trust Network, a collection of certificate authorities. The arrangement will make PKI deployment more practical by giving corporations hands-on control over their own certificates, the companies said.

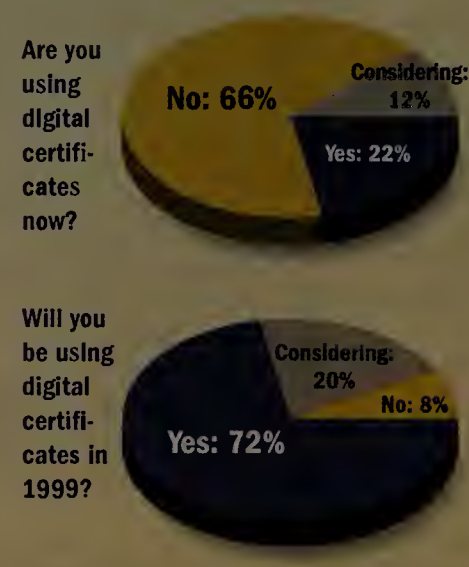
Separately, Isocor of Santa Monica, Calif., announced a family of directory integration software called MetaConnect. Designed to connect information currently isolated in separate corporate directories, the offerings will initially cover popular databases, such as those from Microsoft, Oracle and Sybase. The software also will cover common text file formats, Lotus Notes, Microsoft Exchange and Lightweight Directory Access Protocol-enabled servers such as Netscape Directory Server and Isocor's Global Directory Server.

Scheduled to ship in October, MetaConnect prices will range from $5 to $17 per user. More information is available at www.isocor.com.

— Paul McNamara

CERTIFICATE USE ON THE RISE

Digital certificates are ready to take off, according to a Forrester Research survey of 50 large users.



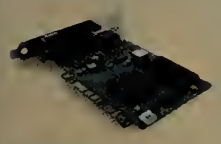
Briefs

■ **Novell** *last week named* **Bill Joy,** *co-founder and vice president for research at Sun, to its* **board of directors.**

When Joy's not helping Novell Chairman and CEO Eric Schmidt strategize in the Microsoft war, the two can chat about old times: Schmidt was another long-time Sun veteran before accepting the top post at Novell.

Also in July, Novell added to its board Reed Hundt, a principal of Charles Ross Partners and former chairman of the Federal Communications Commission.

■ **Madge Networks** *last week announced the rollout of the Smart 16/4 PCI Ringnode Wake-on-LAN* **adapter card for token-ring nets.** *The card makes it possible to turn on PCs remotely, facilitating tasks such as software distribution.*



Madge's *Smart 16/4 PCI Ringnode Wake-on-LAN adapter card for token-ring nets.*

The $280 cards, which are hot pluggable and will work with Windows NT 5.0., are scheduled to be available in September.

✆Madge: (408) 955-0700

■ **Seagate Software** *of Scotts Valley, Calif., has begun shipping what it claims is the first* **backup solution for** *the upcoming release of* **NetWare 5.0** *from Novell. Seagate Backup Exec for NetWare 8.0 also supports Novell Storage Services, Novell SMS, Target Service Agents and Novell Directory Services. The upgrade will allow customers to back up only those files and applications that are used in a normal workday or another pre-set period of time.*

Prices range from $495 for a single server to $1,395 for a multiserver edition.

✆Seagate: (800) 327-2232

NetWare 5.0 to tighten 'Net security

By Paul McNamara
Colorado Springs

NetWare customers who hope to expand their Internet horizons without compromising security received a confidence boost from Novell last week.

NetWare 5.0, on track for an end-of-summer release, will include a handful of previously unannounced Internet security features, the company said. Novell unveiled the additions at Catalyst Conference '98 here, which was sponsored by The Burton Group consultancy and the Network Applications Consortium.

Foremost among the enhancements is Novell's Public Key Infrastructure Services (PKIS), which will allow customers to issue and manage digital certificates without the involvement of a third-party vendor. Without access to PKIS, which will be a free feature of Novell Directory Services (NDS) in NetWare 5.0, a customer looking to use PKI certificates would need to buy a product such as Netscape Certificate Server and contract with a certificate vendor such as Verisign, according to Michael Simpson, a Novell product manager.

"This is a huge step for Novell," Simpson said. "We're really on the front side of the curve on this Internet technology, which is frankly a different place than we've been in a few years."

NetWare customers and industry analysts were similarly enthusiastic.

"PKI is something that we would really like to do," said Craig Olson, manager of network strategy at AgriBank, a St. Paul, Minn., agricultural lender that runs about 500 NetWare servers. "Since almost every server we have is NetWare, it would make sense to do [PKI] in there."

AgriBank would first like to use PKI for e-mail security, and eventually use it for authenticating internal user identities.

One industry analyst said PKI is a natural extension for Novell's directory. "NDS is still a captive directory" that stands to benefit from the external capabilities defined by PKI, said Larry Gauthier of The Burton Group. "From that standpoint, what Novell is announcing is very exciting, and it's going to bring a lot of value to traditional NetWare environments."

In addition to PKIS, new NDS security features in NetWare 5.0 will include:

- A cryptographic infrastructure that allows an application to be accessible worldwide and adapt to the various encryption laws found in different countries. This saves developers the time and expense of writing separate versions of the same application.
- An enhancement to the established single sign-on capabilities in NDS, called "secret store," which will allow outside applications to store user passwords in NDS. In this case, rather than prompting a user for a password, these applications would access NDS and conduct the authentication process in the background.

"This makes life easier for the users because they don't have to remember a million passwords," Novell's Simpson said. "But it also allows the administrator to have lower help-desk costs because people aren't forgetting their passwords all the time."

NDS will also support Lightweight Directory Access Protocol 3 and Secure Sockets Layer 3.

In addition, Novell and Entrust Technologies announced that NetWare 5.0 users will be eligible for a free 90-day trial of Entrust/Alliance PKI for NetWare when it becomes available early next year. The package will give users a single sign-on for NDS, Entrust's PKI software and Entrust-enabled applications.

✆ Novell: (800) 453-1267

New in NetWare 5.0

Novell last week announced a series of Internet security enhancements to Novell Directory Services in NetWare 5.0, including:

- Public Key Infrastructure Services that allow customers to issue and manage their own digital certificates
- A cryptographic infrastructure that automatically adjusts to encryption laws in different countries
- The integration of Secure Sockets Layer 3 and Lightweight Directory Access Protocol 3 in NDS
- Secret store password management designed to reduce help-desk calls
- Infrastructure groundwork for future authentication methods, including Kerberos, SOCKS, tokens, smart cards and biometrics.

Get more online:

- **Novell white papers on various facets of NetWare 5.0**
- **A look at Novell's plans for Java support in NetWare 5.0**

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Veritas readies SAN management tools

By Marc Songini
Mountain View, Calif.

Veritas Software wants to pave the way for greater acceptance of storage-area networks (SAN) by offering new monitoring and management tools.

"This is like the early days of LAN computing, when you needed to assemble lots of pieces," said Mark Leslie, CEO of the storage product company. "We're seeing that coming together now with SANs."

A SAN is a high-speed network, usually based on gigabit Fibre Channel technology, used to link servers to storage devices, such as disk arrays. Any server or application in the network can access data in any SAN-attached device.

But SANs have a long way to go. "There's no software that can manage the storage in a SAN configuration," said Eric Burgener, product manager at Veritas.

Burgener said the company hopes to take the lead in SAN management with its planned product rollout, which will include:

- Cluster Server, which will allow users to run a variety of SAN storage devices and applications simultaneously. The product will initially allow the clustering of 32 servers and their attached devices and ultimately support up to 128 devices.
- Storage Manager, which will permit administrators to perform policy-based management using a graphical user interface that provides a single view of a SAN.
- Volume Manager, which will let users to configure the SAN manually.

The Veritas products will support Sun's Solaris and Solaris x86, Windows NT, and HP-UX. Shipment is scheduled to begin in September. Pricing was unavailable.

✆ Veritas: (800) 258-8649

Veritas SAN rollout will:

- Allow users to cluster storage devices
- Broadcast messages throughout the SAN
- Support Solaris and Solaris x86, NT and HP-UX
- Initially support up to 32 nodes and ultimately support as many as 128 nodes

Y2K is a complete pain.

It's also an opportunity to improve your network.

*For more information about Windows NT Server and Year 2000 see www.microsoft.com/ntserver/y2k.

†Price reduction applies to version upgrades from any previous version of Windows NT Server and competitive upgrades—consult your reseller for a complete list of qualifying competitive products. Discount is up to 20% off estimated retail price of Windows NT Server 4.0. Reseller prices may vary. Promotion does not apply to Windows NT Server 4.0 Academic product. All price reductions effective through 11/15/98. Offer good in U.S. and Canada only.

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Get one step closer to the next millennium.

Get a great file/print server.

Get an outstanding application server.

Get them unified on one platform.

Get up to 20% off and a free Services for NetWare CD-ROM.

Ironic, isn't it? That an inconvenience of Y2K's* immensity might actually do your network some good after all. But consider it this way: since there's no getting away from that major network upgrade, maybe there's something you can get out of it. For instance, here's what happens when you upgrade to Microsoft® Windows NT® Server 4.0:

Windows NT Server 4.0 delivers proven file/print performance. Using the industry-standard Netbench performance tool, Windows NT Server 4.0 outperforms Novell NetWare 4.11 by nearly 17% in file/print throughput tests.

Windows NT Server 4.0 unifies file/print and applications on one platform. It's the ideal choice for supporting key business applications, including groupware like Microsoft Exchange Server. There are already over 4,000 applications for Windows NT Server available today. And, of course, running your applications and file/print on a common platform simplifies the management of your network—giving you more time to focus on achieving your long-term goals.

Windows NT Server 4.0 is the easy way to prepare for the future. It's already the leading intranet platform—in fact, according to IntelliQuest, it's the platform that 56% of corporate Web applications are being built on. And with features like remote access services, virtual private networking and out-of-the-box integration with Microsoft Proxy Server, you can enable cost-effective, secure communication across the Internet among employees, customers and partners. It provides exceptional Web services too—according to NetCraft, more than half a million Internet sites are currently running on Windows NT Server.

Windows NT Server 4.0 reduces total cost of ownership. A recent study by the Business Research Group compared it to NetWare in a mixed environment, and revealed that, as a unified platform, Windows NT Server 4.0 lowers the costs of providing file/print sharing and application support by nearly 20%.

And if you upgrade now you'll save up to 20% off the estimated retail price.† You'll also qualify for a free Services for NetWare CD-ROM (ERP $149) that makes it easier for you to transition your NetWare-based network to Windows NT Server 4.0.

So the question is not: How can I minimize the inconvenience of having to upgrade my file/print? The question is: How can I maximize the benefit of doing so? It seems that Y2K is about more than just surviving the turn of the millennium. Windows NT Server proves that it's equally about making the most of what's left of the 1900s, and getting the 2000s off to a flying start.

Upgrade to Windows NT Server 4.0 and save up to 20%.†

Act now to get a FREE Services for NetWare CD-ROM.

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Citrix prospers, but can it maintain the pace?

Revenue soared in quarter, but potential Microsoft threat still looms.

By John Cox
Fort Lauderdale, Fla.

Just more than a year ago, the price of Citrix Systems' stock nose-dived on rumors that Microsoft planned to introduce its own multiuser version of NT to compete with Citrix's WinFrame product and to capitalize on the growing interest in thin-client computing.

Now Citrix's stock is nearly $70 per share, twice what it was when the rumors surfaced, buoyed by Microsoft's decision to license the Citrix multiuser code. And a growing number of financial analysts have started to track the stock and rate it as a "buy" or a "strong buy." Citrix just reported record revenue and profits, although charges for recent acquisitions and research and development write-offs have created a slight loss in each of the past two quarters (see graphic).

But can a company that handed over one of its key technologies to Microsoft continue to perform so well?

"For now, Microsoft has allowed Citrix to remain off in the background, still doing its own thing, so it's a win-win situation for both companies," said Eric Heimal, technical architect at Harcourt Brace and Co. of Orlando, a Citrix customer. "But if this [terminal server] market explodes, Microsoft is positioned to dominate it. At that point, you have to question Citrix's survivability. Right now, Citrix is riding a wave that could come crashing down on them or they could keep surfing along."

CITRIX'S ROCKETING REVENUE

Company makes huge strides while contending with quarterly loss from acquisition and R&D write-offs.

(In millions)	1998 Q2	1997 Q2	First half '98	First half '97
Revenue	$56.2	$24.5	$105.5	$46.0
Net income	**$17.2***	$8.3	**$33.2***	$15.8

*Totals before charges

One-time Q2 pretax charge:	$ 33.8
Resulting quarterly net loss:	$ 4.4 million, or $0.11 per share
Net loss for first half:	$3.6 million, or $0.09 per share

SOURCE: CITRIX SYSTEMS, FORT LAUDERDALE, FLA.

At least for now, the wave is rising because Microsoft's decision to license the Citrix multiuser code has put a highly visible seal of approval on the concept of thin Windows clients.

In effect, Microsoft has taken over the hard work — creating and maintaining a multiuser operating system — leaving Citrix free to work at becoming the No. 1 supplier of add-on software.

Heimal is deploying Microsoft Windows NT Server 4.0 Terminal Server Edition (TSE) so remote users with a mix of PCs — and eventually terminals — can access business applications at headquarters over a frame relay WAN. Like nearly every TSE customer, he's also using Citrix's MetaFrame software, which runs on top of TSE.

Benefits to remote users

MetaFrame boosts client performance, reduces bandwidth loads and lets users cluster TSE servers. Heimal can run an application at the headquarters' data center, and users at remote sites can log on to it using frame relay and MetaFrame's Independent Computing Architecture (ICA) protocol.

"This is a server-based computing model that can serve up Windows to any kind of client device," Citrix President Mark Templeton said. "The user sits in front of a screen. Where the application runs is not critical."

Citrix's revenue was up nearly 130% in the second quarter compared to a year ago due to increases in several areas: Citrix consulting and other services, licensing fees from Microsoft, and a small amount ($7 million) from sales of MetaFrame, the first of the company's TSE add-on products.

Citrix President Templeton *says the next big push will be handheld PCs.*

At the same time, surprisingly, sales of the existing WinFrame product, based on Windows 3.51, held steady, despite Microsoft's impending release of TSE. Resellers expect WinFrame to continue to be a viable product for some time.

Citrix also garnered revenue from licensing to a growing number of computer makers and information device builders that want to access Windows applications.

ICA is being included on the new generation of Windows-based terminals and is also offered by most vendors of Java-based network computers. The next growth area for Citrix will be handheld PCs running Windows CE, Templeton said. "Traditionally, these have been seen as personal devices," he said. "But by putting our ICA client on them and connecting back to the [TSE] server, you can bring these devices into the enterprise computing fold."

The third wave of growth will be fueled by adding ICA to more exotic devices: wireless terminals, set-top boxes that marry the television with Internet access, and cellular telephones with small screens for accessing the World Wide Web and TSE-based applications.

Citrix is counting on steady revenue from its existing WinFrame software, the new licensing revenue from Microsoft and strong sales of MetaFrame to carry the company until it can extend its product line to add new features for server-based, thin-client computing. Given Microsoft's history of adding more and more to its operating system, Citrix faces a formidable challenge.

✆ Citrix: (954) 267-3000

WIRED WINDOWS

Novell bit by NT bug

If this is Monday, then there must be a new NT security problem surfacing, right? No surprise there, but there is a surprise in where the security problem occurs — Novell's Client for Windows NT. If you are using the Novell Client Version 4.3 for Windows NT you might be able to access information on the local NT Workstation without having to authenticate. All you do is click on the "?" button in the Novell GUI Login, select open from the file menu, then right click on anything in the active dialog box to gain access to files on the local hard drive with system-level rights. I know you would never try it, but a malicious user could then proceed to read or delete sensitive, supposedly protected files. Novell has released an update to correct the issue, but it can be confusing to know if you need the update. The Novell Client Version 4.3 for Windows NT that can currently be downloaded from www.novell.com\download has been modified to prevent this security problem from occurring. Earlier copies of Version 4.3 need a patch file, NT430I1.EXE, which is also available from www.novell.com\download. The patch contains the updated code that prevents this problem and solves other known issues with the 4.3 Client. But how do you know which version of Version 4.3 you have?

Dave Kearns

The best way to see if you have the Client problem is to check the version of the files LOGINW32.DLL in the WINNT\SYSTEM32 directory, and the LOGINW32.RLL in the WINNT\SYSTEM32\NLS\ENGLISH. If the version of these files is 2.00.00, you need to update them. If the version of the files is anything later than 2.00.00, you already have the files that eliminate the problem. You can verify the version of the files by right clicking on the files, going to properties and looking at the File Version.

If you are using Novell's Automatic Client Upgrade or the Novell Application Launcher (NAL) — a component of the ZENworks Starter Pack — you can fairly quickly and easily deploy the update. The patch file NT430IT.EXE ships with a NAL template that can then be imported into Novell Directory Services and associated with the desired users.

Catching the problem was good on Novell's part, but how can there be two different versions of Version 4.3 of the NT Client? Versioning has been a major fiasco for Novell in the past, and evidently it still is. Come on, Novell, at least make them 4.3 and 4.3a — give network managers a fighting chance at knowing what they have.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at wired@vquill.com.

Tip of the week

IDG Books has announced a new series — MCSE Certification . . . For Dummies, *described as ". . . over 300 practice questions, tips on using your test-taking time more efficiently, hints on how to avoid test traps, and a CD-ROM with the unique QuickLearn game, customized demos and cross-references to the book. Certification candidates will find this series a fast, effective and fun way to study for the exams." They are the perfect books for those who can't be bothered actually learning the material.*

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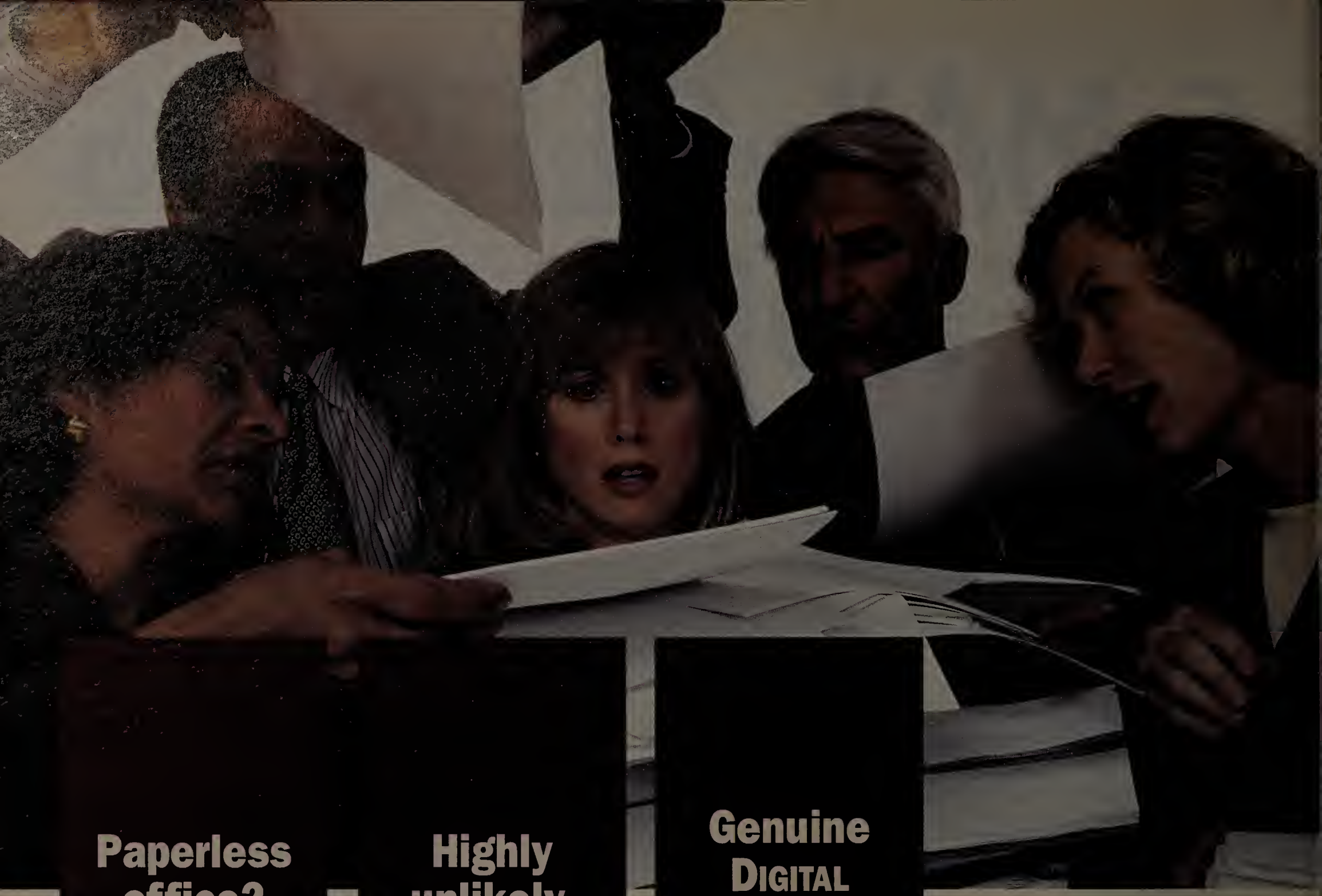

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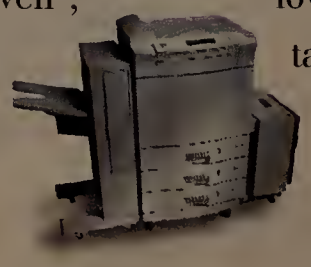

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Briefs

■ **IBM** *and* **Applied Language Technologies (Altech)** *today said they have partnered to combine their* **speech-activated telephone software** *so that banks and insurance, travel and other companies can offer speech-activated services to customers.*

The applications will let customers complete various transactions, such as reserving airline tickets and conducting personal banking, without touch-tone menus or the assistance of an operator.

Under the terms of the agreement, Altech will adapt its SpeechWorks software and other tools to work with IBM's ViaVoice speech recognition software. SpeechWorks and ViaVoice will work on IBM's DirectTalk platform, which is a server and associated software that runs on an RS/6000. IBM has plans to make the software run on additional but as yet undisclosed platforms as well. Products should be available by the fourth quarter.

✆ IBM: (914) 765-1900

■ **Tivoli Systems** *last week updated its mainframe-based enterprise management software,* **NetView Version 1.2 for OS/390.**

New features in Tivoli NetView Version 1.2 include a Java-based management console and graphical user interface, browser-based access, TCP/IP resource monitoring and session management, according to Martin Neath, executive vice president of Tivoli.

Tivoli's *Neath*

For the first time, users will also have the ability to test automated functions in real time and display and correlate SNA- and TCP/IP-related information. NetView Version 1.2 is available now. Pricing is based on mainframe configuration.

✆ Tivoli: (800) 284-8654

Tivoli refugees tackle tech support automation

By Bob Brown
Austin, Texas

It's hard to question the credentials of start-up Motive Communications, Inc.'s founders. The big question is whether this collection of mostly Tivoli Systems refugees can convince customers that they need to buy Motive's software for automating technical support.

START-UP SPOTLIGHT

Formed in May 1997, Motive is made up of a team that includes CEO and President Scott Harmon and Vice President of Marketing Mike Maples, Jr., former Tivoli executives, as well as Tom Bereiter and Brian Vetter, formerly two of Tivoli's leading technical architects. In addition, former Tivoli Chairman Eric Jones is among Motive's directors and financial backers.

"Motive is putting a great deal of emphasis on architecture, making sure its software will scale and support the security needs of large network-based companies," Jones said. "This approach is a spillover from the management team's Tivoli background."

Like IBM subsidiary Tivoli, Motive makes its home in Austin, away from the crowded Silicon Valley start-up scene, and focuses on the less-than-glamorous management software market. But unlike Tivoli, which quietly became a system management powerhouse during the early 1990s by doing a better job than existing players, Motive is addressing a market that until now has been largely ignored.

"Web support today consists largely of 'I publish, you read,'" Maples said. "Computer support today assumes a level of knowledge on the part of the user that is no longer valid."

Motive is targeting "support chain automation," which refers to high-tech vendors supporting their products as well as IT departments supporting end users across an enterprise. The company's software is designed largely to eliminate redundant communication in order to help support technicians fulfill client requests more quickly. Motive claims it can do away with the typical 15-minute-or-more conversation between an end user and a technician by substituting an electronic conversation that lasts less than a minute.

Maples figures Motive's software is coming out at the right time given that companies are having such a hard time finding good technical support people to hire. Anything that automates the technical support process should be welcomed, he said.

The Motive System

The company's Windows NT and 95 Motive System software, which costs anywhere from $50,000 to $150,000 depending on configuration, consists of four main parts: an Internet-based transaction server; end-user client software; support technician client software; and links to existing enterprise network management systems and help desk management programs. The software supports a host of emerging technologies, including Extensible Markup Language (XML) and Java.

The Motive Assistant program runs on a Java Virtual Machine on the end user's NT or Windows 95 desktop system, and gives the end user access to

See **Tivoli,** *page 20*

PROFILE: MOTIVE COMMUNICATIONS, INC.

Headquarters: Austin, Texas
Founded: May 1997
Primary business: Technical support automation software
Management: Mostly former Tivoli employees, including CEO and President Scott Harmon and Vice President of Marketing Mike Maples, Jr.
Key customers: CompuCom, Disney, J.D. Edwards, MCI, Microsoft, Netscape
Funding: Members of the company's management team pooled their resources for Motive's seed money. The company has also collected some $14.8 million in venture funding from Accel Partners, Austin Ventures, SSM Partners and Attractor Investment Management.
Fun fact: Motive's Mike Maples, Jr.'s father, Mike Maples, Sr., was one of Bill Gates' top lieutenants at Microsoft. Maples, Sr. is an investor in Motive and sits on the company's board of directors.

Raising the application performance ante

By Torsten Busse
San Francisco

To better allocate cost and raise productivity, Al Schmidt, vice president of IT at Olin Corp., would eventually like to offer service level agreements (SLA) to some of the $2.4 billion company's business units.

But offering SLAs on application availability and performance for SAP AG's R/3 enterprise resource planning (ERP) applications, the backbone of Olin's information system, is possible only if Schmidt knows exactly what levels of services can be achieved. Olin is a Norwalk, Conn.-based manufacturer of chemicals and metal.

"The problem is that SAP has all the information you want, but it requires an expert to find what you want to know and present it back to the ordinary user," Schmidt said.

Isolating application performance problems for many IS departments often means manually correlating ERP application and network performance statistics using home-grown scripts, stopwatches and spreadsheets.

With network management platform vendors only beginning to add ERP application management features to their systems, and with ERP vendors mainly focused on expanding their applications' business functions, a few vendors, such as Luminate Software, Candle and Envive, are carving out a new market for end-to-end transaction measurement tools.

"What's out there isn't cutting it," said Bruce Fram, president and CEO of 3-year-old, privately held software developer Luminate, based in Redwood City, Calif.

Tools such as Luminate's namesake application for R/3, Candle's ETEWatch and Envive's StopWatch for R/3, however, measure the end-to-end availability and response time of ERP applications, offering statistics sorted by application module, end-user organization or geographical location.

Like network device monitoring software, application performance tools depend on software agents that reside on the network and collect application performance data. For example, Candle's Command Center taps into data collected by agents sitting on the database and application servers running the ERP package, as well as the applications that interact with the ERP system. The collected data is delivered to the central management application, which in some instances is integrated with central network management platforms such as Hewlett-Packard's OpenView, where it can trigger alerts based on user-selected parameters.

The new management applications allow IT managers to know how slow is slow. "It helps us by putting some real numbers on complaints about slow performance," said Thomas Burns, manager of IT capacity and performance services for 3M of St. Paul, Minn.

Busse is a correspondent with the IDG News Service's San Francisco bureau.

Tivoli

Continued from page 19

intranet-based information for performing self-diagnosis, or links the end user electronically to a support engineer for trickier problems. The assistant monitors the situation and has access to historical information about the user's desktop.

In the event that a problem needs to be addressed by a support engineer, Motive Assistant collects data on the problem and issues an XML-based help request via a corporate network or the Internet to the NT-based Motive Server, which in turn forwards the request to the appropriate engineer. The engineer, whose desktop machine is outfitted with Motive's Support Desktop program, can then access the desktop via the 'Net and communicate directly with the end user if necessary. Communication can take place either via store-and-forward messaging or via a synchronous connection.

Depending on what the problem is, the engineer may fix it by sending the desktop a Motive Map, a preprogrammed set of objects designed to run routine fixes that might take engineers a long time to perform.

Motive's software works in conjunction with existing management products, including help desk programs that track the status of trouble tickets and handle escalation procedures.

Motive officials received first-hand knowledge of the core technical support issues experienced by typical companies by conducting a time-and-motion study at 30 companies over 45 days. The Motive employees used stopwatches to time how long it took support technicians to track down certain information and provide help for end users and customers.

Motive officials like to toss around some big numbers to make clear why they are tackling the management of tech support. They claim companies are spending a total of $69 billion per year on technical support and that Motive can help companies eliminate $25 billion in waste from the technical support process by 2005.

Of course, Motive has more modest goals this year. The company is focusing its initial efforts on getting its software up and running at a handful of big customer sites, including Disney, MCI and Netscape. Motive in February started shipping its software to early customers and in June made the software generally available.

Netscape is looking to use Motive's software to better serve its enterprise software customers. Brent Sanders, Netscape's director for worldwide operations, said he likes what he's seen of Motive's alpha and beta code. He said the software works well in helping Netscape technicians work with individual client software users, but the big payoff would come if Motive's software enabled Netscape to automate support for enterprise customers.

Sanders said it would also be important for Motive to port its software to Unix, given that Netscape's Web software runs on platforms other than NT.

Motive's Harmon said a Unix version of Motive's software is planned for later this year. That will be just one of many efforts underway at Motive during the rest of this year. The company, which recently announced it received $10 million in second-round venture funding, is planning to pump up its sales efforts in a big way, he said.

"It used to be that you could take three to five years to build up a business, but the window of opportunity closes so fast these days you don't have much more than 24 months to make your mark," Harmon said.

✆ Motive: (512) 339-8335

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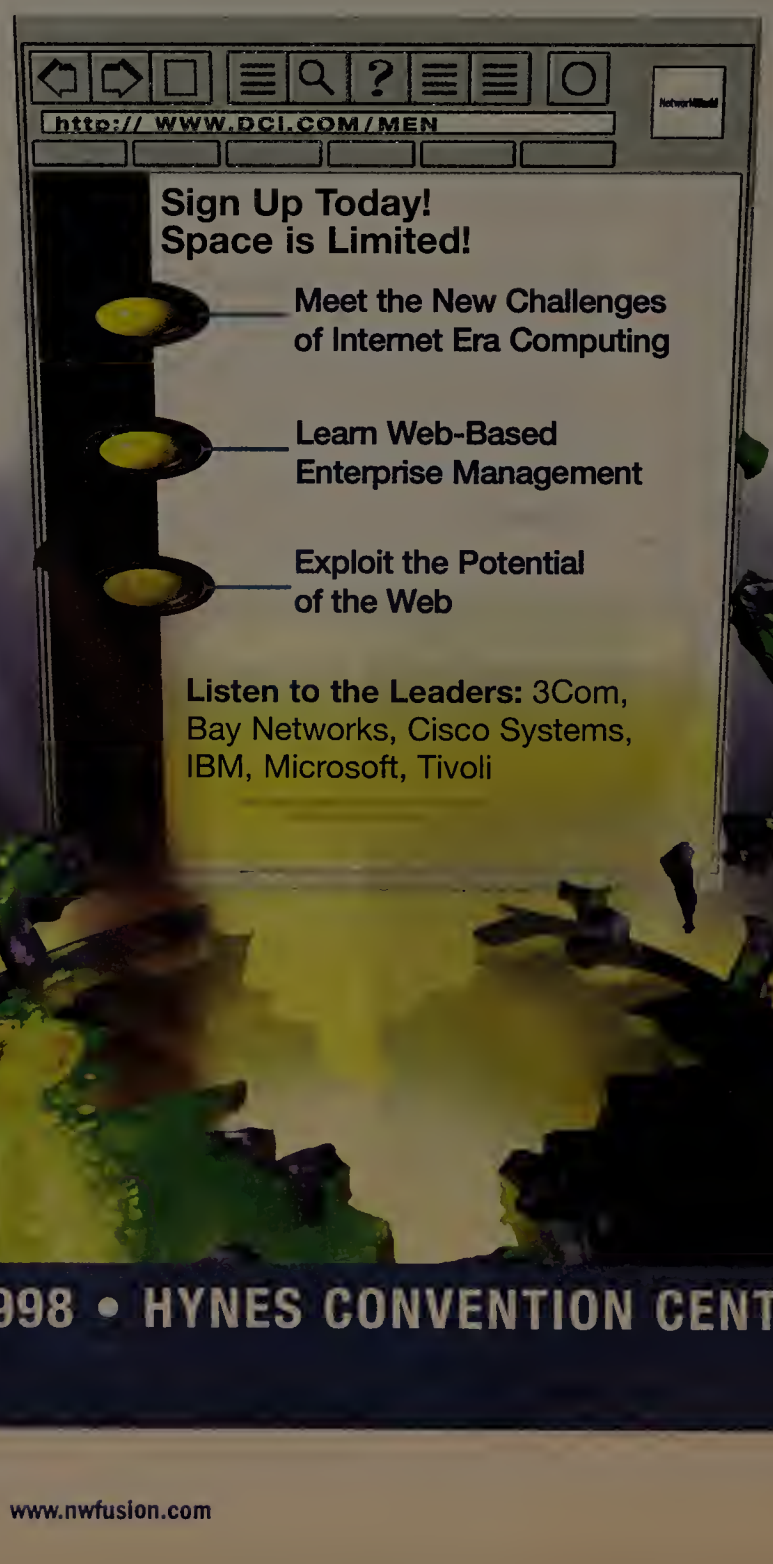

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SPECIAL FOCUS

Building a giant

Cisco: Are the deals worth it?

Most of Cisco's acquisitions have been successful, but there have been a few duds.

By Jim Duffy

Over the past five years, perhaps no other vendor has been on a buying spree as zealously as Cisco.

Cisco has spent about $7 billion to acquire 25 companies, from LAN switching pioneer Crescendo in 1993 through WAN switch leader StrataCom in 1996 to NetSpeed this year. The purchases are intended to broaden Cisco's product portfolio and deepen its research, development and marketing expertise — especially in the service provider arena. The company is attempting to jettison its "router only" persona and solidify a position as the leading supplier of network products for the Internet and intranet markets.

For the most part, Cisco's acquisitions have been successful. The company receives kudos from Wall Street and other observers for striving to maintain the independence and entrepreneurial cultures of the companies it buys. Cisco also targets companies close to its San Jose, Calif., headquarters, believing that adopting close to the mother ship enhances synergy. For companies on the East Coast, Cisco's expanding campus in Research Triangle Park, N.C., serves as "Cisco East."

"The first level we are interested in is the teams and the technologies they're working on," says Ammar Hanafi, manager of business development at Cisco. An acquired company is expected to prove its worth to Cisco within six to 24 months, Hanafi says. Longer term goals include tightly integrating the acquired team and technology into the operational fabric of Cisco.

And two-thirds of the CEOs from the acquired companies are still with Cisco, Hanafi adds.

"We don't call out particular transactions as being successful or unsuccessful," he says. "We don't go into these transactions expecting [a] 100% success rate. If we did that we'd be pretty cautious and ineffective. I can't think of a particular situation that was a disaster, mistake or bad deal." To date, Cisco's LAN switching acquisitions are considered the most successful by analysts and other observers. Crescendo and Kalpana, which Cisco acquired in 1994, are the sources for most of Cisco's popular Catalyst line of switches. These two acquisitions alone have helped propel Cisco to leadership in Ethernet switching, with 37.3% of the $4.7 billion 1997 worldwide market. Cisco ranks far ahead of 3Com, which is No. 2, with 15.7% market share, according to The Dell'Oro Group in Portola Valley, Calif.

"Those acquisitions have just been home runs," says Scott Heritage, an analyst at Warburg Dillon Read LLC in New York.

And the $4 billion acquisition of StrataCom in 1996 gave Cisco instant leadership and credibility in WAN switches for enterprises and service providers. Yet analysts say growth of the StrataCom business has not met expectations.

Sales of StrataCom gear to service providers lagged in 1997, analysts say. Some of that lag may have been due to a lack of cohesion between Cisco and StrataCom products and operations; and some was due to sales lost to Ascend Communications and Newbridge Networks.

"[Router/WAN switch integration] is not what [Cisco was] saying two years ago when they bought [StrataCom]," says Craig Johnson, an analyst at The PITA Group in Portland, Ore. "There are still two heads inside that beast."

Some of that is intentional, Johnson believes, because Cisco does not want to upset sales of its higher margin 12000 and 7500 series routers. Cisco's StrataCom business will face even more pressure when shipments of WAN routing/switching products from Lucent Technologies and Nortel ramp up, he says.

Indeed, not all of Cisco's acquisitions have been rousing successes.

Cisco killed LightStream's only product, the LightStream 2020 enterprise WAN switch, shortly after acquiring StrataCom. StrataCom's IGX switch quickly replaced the LightStream 2020 despite Cisco's insistence that there was no overlap between the StrataCom and LightStream product lines.

Cisco's purchase of Gigabit Ethernet pioneer Granite Systems in 1996 is also one of the industry's great mysteries. Many observers believe Cisco has been less than candid in its status reports on the benefits of the Granite acquisition and on Gigabit Ethernet product development.

Suspicion was heightened when Cisco, after repeatedly stating it would wait until the Gigabit Ethernet standard was complete before shipping products, released products based on Granite MAC and PHY chips well before the standard.

Those products — switch modules and uplinks for the Catalyst 5000 line — disappointed industry analysts. Many were expecting the Granite technology to result in a new generation of Layer 3 switching Application Specific Integrated Circuits (ASIC) for wire-speed Gigabit Ethernet crossbar routing switches that could scale enterprise networks up to and beyond 100G bit/sec — a project Cisco sources referred to as "Milan."

But when Cisco rolled out the Catalyst 8500 line in April, which uses Layer 3 switching ASICs from MMC Networks, some observers saw it as a confirmation that the Granite acquisition was a wash and maybe Milan was too.

"[Granite was] never intended to [provide] the full-fledged Layer 3 ASICs for current or future products," says Jayshree Ullal, vice president of enterprise marketing at Cisco. So even though it took awhile for Cisco to deliver the goods from Granite, that acquisition and the StrataCom acquisition have been successful, according to Hanafi.

Observers are also waiting for Cisco's acquisition of the Dagaz business of Integrated Network Corp. to bear fruit. Dagaz makes digital subscriber line gear for enterprises and service providers in international markets. Yet Cisco acquired another DSL company — NetSpeed in Austin, Texas — after Dagaz. Yet Cisco released NetSpeed-based products before Dagaz-based gear. ■

TRACKING CISCO'S ACQUISITIONS

Company	Acquired	Product	Success	Flop?	Jury still out
Crescendo	1993	Catalyst LAN switches	•		
Dagaz Technologies	1997	International DSL gear			•
Granite Systems	1996	Gigabit Ethernet		•	
Kalpana	1994	Catalyst LAN switches	•		
LightStream	1994	LightStream 2020; LightStream 1010*		•	
Nashoba Networks	1996	Catalyst 1800 token-ring switch		•	
NetSpeed	1998	DSL equipment	•		
Network Translation	1995	Firewall, server load balancing	•		
StrataCom	1996	WAN switches			•
Telebit/MICA	1996	AS5300 dial access	•		

*Believed to have been developed by Cisco in San Jose, rather than Cisco/LightStream in Billerica, Mass.

Briefs

■ **Allegiance Telecom** *last week announced that it has implemented* **permanent local number portability (LNP)** *in New York with Bell Atlantic and in Texas with SBC Communications. Permanent LNP is key to competitive carriers because it lets customers sign up with a new carrier and keep their old telephone numbers. LNP is also a requirement for established local carriers before they can get permission to sell long-distance services. Allegiance has worked out LNP deals in Los Angeles and Chicago as well.*

■ **PSINet** *last week announced a set of* **three voice-over-IP services** *aimed at large enterprise networks.*

The first service that will be rolled out to PSINet's 39,000 subscribers is **iPEnterprise.** *With iPEnterprise, PSINet said companies with PBXs can obtain carrier-grade voice services at a lower cost. IPEnterprise could* **save customers up to 50%** *on their internal communications bills when used with other PSINet services such as iPFax, PSINet said. Customers will pay a monthly charge for the voice service based on the bandwidth used, comparable to the rates PSINet charges for data services. The greatest savings will be realized by companies making international calls among the 12 countries in which PSINet operates.*

The second service, **iPEnterprise Plus,** *will offer IP voice service to PSINet's extranet customers. The Plus service will support simplified dialing codes, desktop faxing, conference calling and unified messaging services. The third service,* **iPGlobal,** *is aimed at the consumer. According to PSINet, the ISP plans to build gateways to interconnect its global network with the public switched network. The three services will be rolled out over the next 18 months or so.*

✆ PSINet: (800) 395-1056

AT&T, BT to craft international venture

Telecommunications giants promise global one-stop shopping for voice and data services.

By Tim Greene and IDG News Service

Two of the biggest names in telecommunications, AT&T and British Telecommunications, as expected last week said they will team up to offer corporate customers one-stop shopping for international voice and data services — but it is unclear how widespread their offerings will be (*NW,* June 29, page 1).

AT&T and BT have grand plans for their unnamed joint subsidiary, including construction of an international IP-based network that will connect 100 cities across the world at 200G bit/sec.

The network will serve as a backbone for corporate customers that want to set up global intranets, international call centers and multimedia networks, AT&T and BT said. The companies did not say when they will complete the network, however. AT&T executives also said it will pull out of other international alliances.

The new company will build on AT&T's strong U.S. presence and BT's strength in Europe, but neither company will be able to offer much in Asia, Latin America or the Pacific.

The joint AT&T-BT venture will focus on three areas:

- Voice and data services that will combine AT&T's corporate offerings with BT's Concert product line to offer corporations frame relay, private-line and value-added IP network services.
- A global sales and service business that will tailor network services to companies in specific industry sectors, including financial, petroleum and IT. The group will draw 250 customers from AT&T's and BT's existing client base of multinational companies, the partners said.
- A carrier service business that will supply wholesale international pipelines to other carriers and manage all the international connections.

Analysts generally applauded the new venture.

"Now it's a horse race," said Jeffrey Kagan, president of Atlanta-based Kagan Telecom Associates. The alliance "will create another powerful player in the global marketplace which will pit the world's top telephone companies against each other in a competitive free-for-all," he said.

Kagan added that challenges remain. AT&T still needs to develop a strategy for the U.S. local market and both partners need to strengthen their Internet businesses, he said.

In addition, AT&T's new Chairman and CEO C. Michael Armstrong is bringing rapid changes to the company that are "pushing many at AT&T outside their comfort zone," Kagan said.

Since Armstrong took over, AT&T has bought TCI, a cable TV company, and Teleport Communications Group (TCG), a competitive local exchange carrier. It has entered technology agreements with a slew of hardware vendors.

AT&T said its WorldPartners alliance will not be extended beyond 1999.

Along with many other international carriers, the WorldPartners alliance includes Kokusai Denshin Denwa of Japan and Singapore Telecommunications.

Additionally, AT&T said it will leave its alliance with Unisource NV, a consortium that includes KPN of the Netherlands, Swisscom and Telia of Sweden.

The exit of AT&T from these two consortia places greater pressure on the company's remaining alliances to find strong partners in Japan, according to Toshiaki Iba, an analyst at ING Barings Securities in Japan.

Much of the AT&T-BT subsidiary's focus will likely be on cracking the newly regulated Japan market — the world's sec-

See **Venture,** *page 26*

A global endeavor

Sir Iain Vallance

- BT Chairman Sir Iain Vallance will be the venture's first chairman
- Number of employees worldwide: 5,000
- International, multinational company and carrier accounts: 6,500
- International voice traffic covered by the venture: 25 billion minutes
- International private line circuits: 200,000
- International network reach: 237 countries
- Private line network nodes: 6,000 in 52 countries
- Frame relay nodes: 1,000 in more than 40 countries
- Customer care and network management centers: 12
- First-year revenue: $10 billion

Users wary, but AT&T-BT has big potential

Customers of AT&T and British Telecommunications stand to reap the dual benefits of convenience and savings from a proposed joint venture between the two that will offer global telecom services.

The plan, which promises one-stop shopping for worldwide telecommunications lines, fits the description of what users have been waiting for, according to Phil Evans, senior telecom consultant with Perot Systems. "It's one of those visions of one-stop shopping in a global environment that will ensure very high-quality services at very cost-efficient prices," Evans said.

While the outline of the AT&T-BT plan sounds good to users, a dose of caution is advisable. The deal requires establishing a separate company and setting up a new network, both of which take time.

Plus, based on the geographic regions where the two companies offer services, the companies may have a few weak coverage spots, particularly in Asia, the Pacific and Latin America.

But given that BT has already run an international telecom joint venture, Concert, BT may be in a good position to anticipate and overcome problems that the new venture might face.

"Concert was a bold step forward, and I'm sure BT and MCI and the other players in Concert learned a lot. And I suspect a lot of the competitors learned a lot by observing Concert and trying to determine what they did right and what they might not have done so right," Evans said.

Beyond potential delays, the involvement of two companies could create problems for customers trying to nail down service guarantees, Evans said. "One company, one ownership gives you a better feeling that you can control or know what to expect from the company with which you are dealing. But the alliance is the next best thing to it. If there is no one company that can provide everything you are looking for, you go with the best that you've got," he said.

The promise that the companies will set up an IP backbone that can handle voice, video and data is attractive, according to Dick LeFave,

See **AT&T-BT,** *page 26*

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WAN MONITOR

Bringing simplicity into a networked world

Sun and Microsoft continue to do battle for the dominant positions in the consumer electronics and home network markets. Over the next 20 years, these consumer markets could dwarf the business network and computer industries. But the consumer's requirements are different from those of the business user's.

For the consumer, networking must be simple and transparent — period. And if the industry is able to achieve network simplicity for the consumer, then we would see corresponding benefits in the business market.

In the near term, the home or remote network focus continues to be primarily on the home PC, set-top box and phone. But some visionaries foresee a future in which many more household appliances are network-enabled. Without significant changes in how networks and networked devices behave, though, we can't help but think about the potential nightmares that await the average household.

Think about today's networked devices in the business market. The more intelligent the device, the more difficult the problems. PCs, servers and routers are probably the most notorious, but printers and other single-function devices still have their share of troubles. The average businessperson has people to rely on to help trouble-shoot and resolve problems. In large companies, whole IT groups are dedicated to designing and managing the devices in the network. Then there is a help desk just to support users.

Now imagine having most of the appliances in your home connected to a network. When a device is working, it's great. But how often will it malfunction or fail entirely? And what will you do then? Will every house keep a network equivalent of an address book, listing the IP address of each device and help desk numbers to call when each one fails?

Daniel Briere
Christine Heckart

Does the entire household have a single integrated operating system or does each device have its own, or both?

Can you imagine going through an operating system upgrade every year or two for all the devices in your home? Can't you just see it? You upgrade the main operating system in your home so that you can gain greater functionality and speed and more features for your phone, PC, TV, etc. And all of a sudden your relatively old refrigerator or air conditioner doesn't work because the new operating system isn't backward-compatible with the systems in these devices. Who will trouble-shoot the problem?

We can't assume that each home will have an IT expert to design and manage the policy, security and integrity of the system. We can't hope that consumers will accept a whole new cottage industry designed to remotely manage the home network and make round-the-clock house calls when needed.

We can't presume the average consumer would be willing to budget an extra $50 per month for an outsourcing contract to handle all of the complexities associated with the network. So we must assume that the home network appliance and the entire system will be much more interoperable, easier to implement and maintain, and significantly more transparent than networking is today.

So the desire for success in the high-stakes consumer market will drive many companies like Microsoft, Sun and Cisco into a plug-and-play business model. The networking complexities we endure out of necessity today won't be acceptable in the networked home or business of tomorrow.

Everything from the operating system to the applications to the hardware will need to be simplified before the smart home becomes a reality. Hopefully a by-product of that effort will be a more transparent, manageable and cost-effective business network.

Briere is president and Heckart is vice president of TeleChoice, a consultancy in Boston. They can be reached at dbriere@telechoice.com and checkart@telechoice.com.

AT&T-BT

Continued from page 23

vice president of the International Information Technology Users Group and chief information officer of Southern New England Telephone.

"The claim that it's going to be an IP network and it's going to be revolutionary from an industry point of view is great news. The problem we see with some of these things from a network side is it takes time and it takes energy, especially when you have two big players like BT and AT&T trying to work it out," LeFave said.

Perot Systems' Evans said he hopes the joint venture goes well, but recognizes that the companies face challenges. "I think [AT&T CEO C. Michael] Armstrong has a mission, and he's trying to execute on it. He's very talented in terms of being able to pull some of this off. [The venture is] big, it's got all the issues of trying to form a company as well as trying to move technology along."

LeFave agreed, despite AT&T's intent to pull out of some other international alliances. "If you look at how important this alliance is compared to perhaps some of the other ones they have done in the past, this one I think carries the fingerprints of Mr. Armstrong on it, so I think he is going to want to make it happen," he said.

While the excitement of using a new, cutting-edge network is appealing, potential customers should use prudence in dealing with the company. "With the big international customers, with the amount of volume on their networks, they're going to have to have some degree of assurance before they start switching [carriers] around," LeFave said.

Evans said current BT or AT&T customers can leverage that business relationship with the new venture. Customers can require procedures and service levels on at least on a par with what they are already getting, and ask for more, he said.

Expanding an existing relationship can also be easier than establishing a new one, Evans added. "For example, I know our network folks can work well with the network folks at AT&T with whom they have been working for months and months," he said.

LeFave agreed. "If you are using AT&T and BT today this could be an opportunity to enhance that further. Especially if you are looking to bridge Internet capability as well as having some voice capability.

— *Tim Greene*

Venture

Continued from page 23

ond-largest telecom market — where BT has been wooing local lead carrier Nippon Telegraph & Telephone, analysts in Tokyo said.

From the BT side, the deal with AT&T represents a rebound from its failure to acquire MCI earlier this year.

BT has pursued other global alliances in the past, with mixed success. Its original global alliance with MCI — Concert, formed in 1994 — is now changing as a result of MCI's purchase by WorldCom. AT&T will become a distributor of Concert services, and MCI will divest as a result of its purchase by WorldCom.

Analysts are predicting the AT&T alliance will give BT a much-needed entry into the U.S. market and the ability to expand more rapidly in regions such as Europe and Asia.

Perhaps more significantly, the deal might reduce the competition both companies face, at least in the international market. Analysts are optimistic about the deal despite the failure of other multinational global alliances.

"BT needs a U.S. partner. They are not going to survive globally without one," said Emma Whitten, research director at CIT Research, a telecom research and strategy firm in London.

Get more online:

- **Read more on MCI's Concert venture with BT**
- **News of other global nets**

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Now BT can move into the U.S. market without having to face the largest carrier in the market as a competitor. "We are not going to be competing head-on with AT&T in the U.S.," said Simon Gordon, a spokesman for BT.

The partnership with AT&T will benefit BT significantly, Whitten said.

"AT&T has a fantastic reputation with customers all over the world, not just American customers," she said. "They have a very good record with network reliability and being good to deal with."

Analysts and investors are pointing to one major difference between MCI and AT&T that also benefits BT. MCI would have had to invest heavily to offer local phone connections. With its purchase of TCI and TCG, AT&T will have the local loop covered.

BT is wiser following the collapse of the MCI deal, Whitten said. "BT's experience with Concert and collaboration with MCI will stand them in good stead," Whitten said. BT learned a lot about gaining and retaining customers and marketing from MCI, she said.

The venture is expected to contribute a total of about $1 billion to BT and AT&T in the first year and grow 15% to 20% each year.

"Pulling together the resources and assets is going to reduce transmission costs and overhead, and that will result in cheaper prices for customers," BT's Gordon said.

BT gains the goodwill that comes with the well-established AT&T name, CIT's Whitten added. "AT&T's reputation will help [BT] to sign up the very large multinational contracts, but it won't help them with local markets," Whitten said.

But even this deal, probably is not the last word we will hear from BT about global alliances.

"We've been in talks with lots of people," said Gordon of BT. ■

Briefs

■ **Network Associates** *last week added another trophy to its wall with the announcement that it will acquire* **CyberMedia.** *The approximately $130 million deal will give Network Associates CyberMedia products such as First Aid, Uninstaller and Oil Change, all of which will be merged into Network Associates' McAfee Software division. Other recent acquisitions include Pretty Good Privacy, Trusted Information Systems and Dr. Solomon Group.*

■ *Working with Atlanta-based Internet Security Systems, Microsoft has identified a* **denial-of-service vulnerability** *in* **Microsoft Exchange Server 5.0** *and 5.5 and Microsoft's NNTP news server. Hackers could incapacitate a server using a newly discovered buffer overflow problem. To prevent servers from crashing, Microsoft is urging users to download a security patch at www.backoffice.microsoft.com/downtrial/default.asp.*

■ **NetScreen Technologies** *last week began shipping two* **encryption-capable firewalls.** *The $9,995 NetScreen-100, designed for 100M bit/sec corporate LANs, supports up to 32,000 concurrent sessions.*

The $3,995 NetScreen-10 with 10M bit/sec throughput supports up to 16,000 users. Both firewalls include network address translation, dynamic filtering of network services and URL blocking.

✆ NetScreen: (408) 970-8889

■ **Allot Communications** *has announced* **Cache Enforcer,** *a module for its AC200 and AC300 bandwidth-management products that enables policy-based redirection of Web page requests to cache servers for improved performance.*

Pricing for Cache Enforcer is $2,995. The module is due to ship in September.

Whither push technology?

Once the buzz of the industry, push companies shift their focus.

By Andy Eddy

When it hit the Internet scene just a couple of years ago, push technology was viewed as a rising star that inspired plenty of venture-capital investments and news-page buzz.

Now you're lucky if you can find a company willing to admit it's involved in push technology. Instead, mission statements and corporate position papers show the push companies of old aligning themselves with areas such as knowledge management and automated software delivery.

The original promise of enabling users to subscribe to interesting information channels and then pushing that content to their desktop was enticing. However, people often found the channels unfocused, and too much time and energy was required to find buried information. Additionally, network managers found that the immense flow of data to the desktop was eating up precious bandwidth.

Overall, though, the push concept seemed to wither because it simply became more work for the recipients than originally hoped.

In light of that, many companies have changed their strategies while others have become acquisition bait. For instance, Tibco Software purchased inCommon, and Vantive acquired Wayfarer Communications.

Even Microsoft and Netscape, which still provide integrated "Webcasting" products in their respective client software suites, have generally downplayed the technology. Push channels are still being offered, but not with the same exuberance and motivation as before.

As it is currently used, push has made a subtle but distinct shift. What mostly started as a one-to-many technology is being refocused by the more successful survivors: The funnel of information is narrowing into a one-to-few or few-to-few delivery process. As intranets and extranets have developed, enabling directed Web-based communications to employees, business partners and customers, elements of push make it possible to keep the chosen in touch and keep data fresh.

"Making sure information is updated is important," said Alexis dePlanque, senior research analyst for the META Group consultancy. "I was on a sales call where the person's collateral was so out of date it referenced an employee who hadn't been there in two years."

BackWeb Technologies sees the need for up-to-date information as an opportunity. Its Infocenter product, now at Version 4.0, enables BackWeb customers to distribute support information and even application patches and revisions. The company was recently signed to provide its software to such companies as Microsoft, Compaq and Computer Associates International.

Similarly, Diffusion's Diffusion Server provides for what it terms "customer relationship management," enabling a company to pass information and alerts to selected clients and partners via the World Wide Web. Diffusion is releasing Version 3.0 of Diffusion Server this week through reseller partnerships with companies such as Netscape and Hewlett-Packard. It's also landing new customers such as NationsBank and SmithKline Beecham.

DataChannel has a product called DataChannel RIO, which uses Extensible Markup Language to leverage corporate information stored in a database. The product enables information to be published on the Web without the need for a Webmaster. This "save to the Web" technology provides for drag-and-drop posting of content from Windows applications. At the same time, it provides the tools that manage who can receive the information.

Media darling Marimba orig-

See **Push,** *page 30*

When push comes to shove . . .

The push industry is in flux and fragmenting. Some recent highlights:

- PointCast, perhaps the best-known push company, backed away from its IPO in mid-July, claiming it would instead focus on establishing strategic partnerships as a private company.
- Marimba shifted its focus to software distribution with Version 3.0 of its Castanet software, announced in late June.
- BackWeb has sought out partners, pairing with companies such as Microsoft and Compaq.
- Wayfarer Communications in mid-June was purchased by Vantive, which also announced VantiveVista, a product blending the companies' strengths.

QUICK TAKE: WEB-BASED VISUAL COLLABORATION

Streaming technology key to Envision3D

A start-up last week unveiled a Web-based application designed to speed the transmission of 3-D models over corporate intranets and extranets, making it more feasible for design teams in multiple locations to collaborate on projects.

Adaptive Media's Envision3D uses streaming technology to transmit complex, graphics-intensive 3-D models 10 to 20 times faster than other Web-based products, company officials claimed.

Chief Technology Officer Deven Kalra said Envision3D increases transmission speeds using object simplification and real-time culling, the primary features of Adaptive's patent-pending 3-D streaming technology. Object simplification creates a representation of a 3-D graphic using fewer data points, meaning there is less data to transmit and thus speeding the transfer. The real-time culling feature determines what parts of a 3-D model are needed for the current view and transmits only those portions.

Envision3D consists of a file converter, server software and a client plug-in. It supports Microsoft's DCOM and OpenGL, as well as ActiveX and Netscape plug-ins.

The product is scheduled for commercial release in the third quarter. The initial installation price will be $24,995.

Adaptive, located in Sunnyvale, Calif., was founded in 1996. The company also announced last week it has closed a third round of venture financing for $6.5 million. Information Technology Ventures of Menlo Park, Calif., and TL Ventures of Philadelphia contributed $3 million each.

Adaptive Media: www.adaptivemedia

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- **Downloadable push clients**
- **A look at some push vendors' initial hopes for the technology**

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Faster JVMs give Java a jolt

By Chris Nerney

A new generation of souped-up Java Virtual Machines (JVM) could make server-side applications written in the programming language almost as powerful and fast as those written in C++, recent benchmark tests by Volano LLC show. The San Francisco-based company sells chat server software.

That's good news for thousands of programmers who are attracted to Java's cross-platform potential but leery of its often sluggish performance and relative instability.

It's also good news for Java creator Sun Microsystems, which has been touting 1998 as the year Java migrates from the client side — where it has had limited success — to the server.

While the move toward server-side Java development clearly has begun, there has not been a headlong rush. Most enterprises interested in Java are sticking with testing and small-scale deployment as they wait for the programming language to mature.

The release earlier this year of Enterprise JavaBeans — chunks of precoded software that allow developers to rapidly build server-side Java applications — was a big step in that direction. Faster, more scalable JVMs should be another step.

"The difference between Java and C++ is getting smaller and smaller," said Anne Thomas, senior analyst for the Boston-based Patricia Seybold Group.

By year-end, there should be at least five JVMs that can deliver adequate speed, stability and scalability to the Java platform, said John Neffenger, creator of VolanoMark, a benchmarking tool that measures Java performance and scalability on servers.

"These tests show enormous improvement" over benchmarks performed last December, Neffenger wrote in the August edition of *JavaWorld,* an online publication. "The Java platforms are now more than 10 times faster, vastly more stable, more than twice as scalable when adding processors and able to handle roughly 10 times the number of network connections [compared with] just 18 months ago."

Indeed, four of the new JVMs are faster than the fastest currently available JVM, the IBM Java Development Kit (JDK) 1.1.6 (see graphic). And three of the new JVMs — from Novell, Microsoft and Sun's JavaSoft division — scored as well or better on scalability tests than the benchmark leader of available products, Microsoft's Software Developer's Kit (SDK) 2.02.

The runaway winner in the speed category, Tower Technology's TowerJ 2.1.2, uses a different approach than standard JVMs, which employ Just-in-time compilers to translate Java code into instructions as the application is running. TowerJ instead optimizes the application before it is executed.

"What's been holding back Java on the server has been concerns about performance," said Madison Cloutier, marketing vice president for Tower Technology in Austin, Texas. "Now I think you'll see a lot more server-side work done in Java."

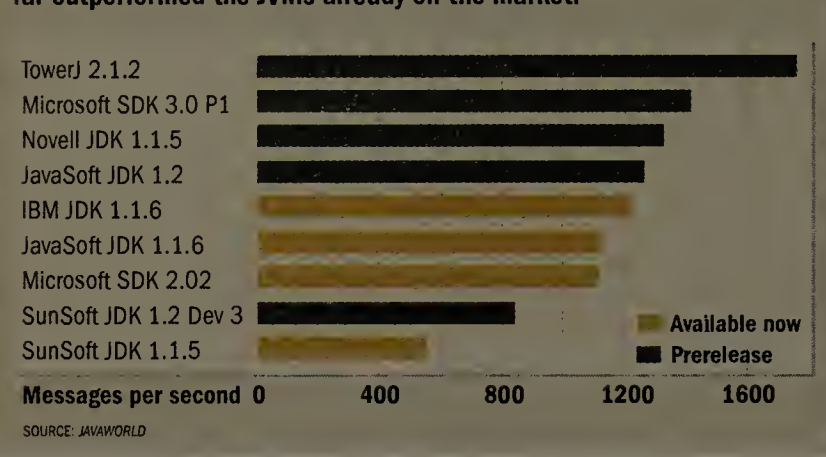
One user said that while faster JVMs should help performance, some of the problems are related to programming.

"More than a third of Java's performance problems can be directly attributable to poor code," said Colette Coad, U.S. leader of Ernst & Young's Java-Based Computing initiative. "Java as a language has been trivialized as being so easy to use that a lot of people who have taken Java 101 are passing themselves off as experienced Java developers."

Coad said that while the "syntax" of Java programming is relatively easy to pick up, "unless programmers are incorporating object-oriented concepts, they're going to write poorly performing code." ■

FAST TIMES AHEAD

A new generation of high-performance Java Virtual Machines (JVM) could accelerate the development of Java on the server. Based on benchmark tests performed by Volano, prerelease versions of the JVMs far outperformed the JVMs already on the market.



SOURCE: *JAVAWORLD*

Push

Continued from page 27

inally offered its Castanet software as a way to update Java applets, enabling content providers to support recreational uses such as delivery of daily crossword puzzles. With Castanet Version 3.0, the company has begun to cater more to the software distribution needs of the corporate world.

Perhaps the biggest name in push has been PointCast. While the company has polished its software — it recently released Version 2.5 and has a beta of Version 2.6 publicly available — the biggest news of late concerns its financial decisions. An initial public stock offering was recently withdrawn, with President and CEO David Dorman stating that PointCast would be better able to pursue strategic partnerships as a private company.

"PointCast's future is at best uncertain," META Group's dePlanque said. "People find [pushed] information is not all that relevant, and it's commoditized by the free information that's available on the Internet."

Push technology hasn't disappeared, but it appears to have morphed into processes for controlling communication — much as the whole Internet has evolved from being a billboard into an interactive and collabo-

'NET INSIDER

A role for technologists in Internet management?

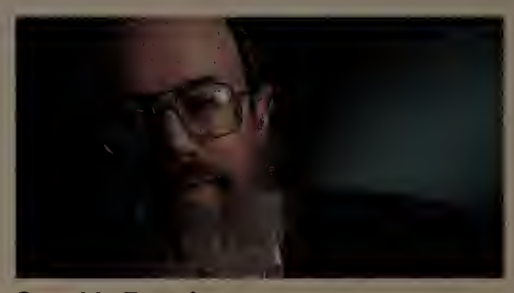
It's been five and a half years since I started writing this column. For the first two years, I used many columns to defend the Internet as real and claimed that it would grow in importance in the future.

In one column I wrote, "In the universe where I live, the Internet is the future. The Internet is growing into the ubiquitous connectivity service. In this universe, we are building the future rather than waiting for someone else to hand us something they think might be what we want. (Generally determined without the process of asking.)"

This is not meant to be an 'I told you so' column but rather one of amazement and more than a little bit of trepidation.

I just got back from Geneva, where I attended the Internet Society's annual meeting (www.isoc.org) and a subsequent meeting called the "International Forum on the [U.S. Government's] White Paper" (www.geneva.ifwp.org). The forum is working toward a consensus on how to deal with the U.S.' intention to withdraw from funding some of the basic infrastructure operations for the Internet as announced in a white paper (www.ntia.doc.gov/ntiahome/domainname/6_5_98dns.htm).

The forum had people from around the world discussing the implications of a potential power vacuum left behind as the U.S. government withdraws from the scene. The results are still intermediate because this was one of a series of meetings with the last one scheduled for Singapore in the middle of August.


Scott Bradner

But what was impressive about this meeting was the fact that it was not just a room full of Internet geeks. Speakers included a top advisor to President Clinton and a minister for the European Commission, and participants were from all areas of business, education and government. If anything, the Internet geek community was underrepresented.

I've looked back on the columns I've written in these past five years and have thought back to the many conversations I've had during the same period. It is clear that the Internet technical community, which I like to think myself part of, missed the boat in really understanding how much control of this network was going to slip out of our hands.

Most of our predictions about the inevitable success of the Internet in the face of governmental regulations have come true. We knew we were going to be successful but failed to adequately appreciate how much the result would look like honey to the regulatory bears and ants.

It is not going to get easier in the future to minimize the effect of governmental "help." The Internet now plays a role in the economic health of the industrialized world that few observers could have imagined even a few years ago.

The outcome of this series of meetings will help determine if there will be a role for the technically cluefull in Internet management, as the white paper recommends, or not, as some of the businessmen and politicians would rather.

Wish us well.

Disclaimer: Harvard has no position on Internet governance (it's too new), even though some Harvard people do.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@harvard.edu.

Technology Update

Covering: Evolving Technologies and Standards

NUTTER'S NETWORK HELP DESK

Ron Nutter, a Master Certified Novell Engineer and Microsoft Certified Systems Engineer in the Lexington, Ky., area, tracks down the answers to your questions. Call (800) 622-1108, Ext. 7476, or send your questions to helpdesk@networkref.com

Firewalls are a hot topic among network managers, as evidenced in a recent Help Desk Forum on www.nwfusion.com. I thought it'd be interesting to share some of the questions and answers spurred from a firewall review *Network World* recently ran (*NW*, June 1, page 53).

How about doing a test for a firewall-to-firewall virtual private network (VPN), with at least 56-bit encryption? We are having a lot of problems with our firewall not handling fragmentation properly. Is anyone doing firewall-to-firewall VPN successfully?

Joel Synder, a senior partner at Opus One in Tucson, Ariz., answered: When *Network World* reviewed VPN products, it became clear that firewalls do not belong in them, except in some very specific applications in which the benefit of the combined authentication system and the lack of a call-out firewall authentication requires placement in the same box. VPNs should be in separate boxes. This configuration is cheaper and easier to manage, and lets the VPN gurus work on their own products without having to coexist with the firewall folks.

Do you think the trend toward applications that dynamically assign port numbers is alarming? It appears that many new Internet applications negotiate a wide range of port numbers during connection setup.

Synder responded: Yes, this is a big deal. I tell people that this is their biggest burden: Do they say, "Port 80 or bust," and take it from there, or do they decide they'll support every application known to man? This is one of the reasons that the proxy vs. filter debate was decided. It is now clear that proxies are required for some of these new applications.

New PC spec boosts computer telephony

By Barbara Loonam

The telecommunications equipment industry is a $150 billion business today, but 90% of the trade is built on proprietary hardware and software architectures.

Over the past few years, however, multivendor PCs have begun to penetrate every sector of the telecommunications industry. While PCs have been embraced for applications such as voice mail, interactive voice response and IP telephony gateways, users have been hesitant to use PCs for such mission-critical devices as PBXs and switches within the central office of the public switched telephone network (PSTN). For while PCs offer many benefits, including cost-effectiveness, an open development platform and high levels of scalability, they have fallen short on offering high availability.

Enter CompactPCI.

CompactPCI is an evolving specification that defines how PC components should be built to ensure high availability and hot-swappable capabilities.

For our purposes, high availability means keeping systems running by decreasing downtime during routine maintenance operations and system failures.

High-availability systems differ from fault-tolerant systems, which use redundant hardware and proprietary software to provide nonstop operation. While not guaranteeing 100% uptime, high-availability CompactPCI systems provide an improvement in service over conventional computer systems.

A number of companies are now collaborating to define how the CompactPCI specification will be implemented and deployed in telecom platforms. Other groups are looking at how to integrate the Enterprise Computer Telephony Forum (ECTF) H.100 bus and provide telecom I/O through the CompactPCI backplane.

The Telecom Interest SubCommittee (TISC) of the PCI Industrial Computer Manufacturers Group (PICMG) was formed in April 1996. TISC's purpose was to extend the capabilities and utility of the CompactPCI system architecture to support the application needs of the computer telephony industry.

The TISC document provides CompactPCI system vendors and computer telephony board vendors with specifications that define multivendor interoperability and support the design of open standards-based components and systems.

Key features include the H.110 backplane time-division multiplexer bus, which incorporates the ECTF's H.100 bus and hot swap; rear-panel analog and digital PSTN connections; telco power and ground; physical keying of boards; and board and shelf addressing.

The TISC collaborative effort has resulted in a rugged industrial chassis with well-established mechanical specifications that provides all of the advantages of a hot-swap industrial computer chassis while retaining compatibility with all desktop PC software.

Reducing downtime

The other major idea behind CompactPCI development and deployment is to reduce downtime in any telecommunications system. Users need to be able to replace network interface boards and digital signal processor adapters while the system remains up, or "hot." Until recently, this support was not available on PCI boards or with the Windows NT or Unix software platforms. Now there are two initiatives, PCI Hot Plug and CompactPCI Hot Swap, to provide this capability.

The PCI Hot Plug specification defines the requirements for hot insertion and extraction of conventional PCI boards in server systems. Led by Compaq, the hot-plug initiative has achieved broad support from major operating system vendors, including Microsoft and Novell. Compaq and other chassis vendors are currently shipping hot-plug systems.

Hot swap defines a process for inserting and extracting boards without adversely affecting a running system. Hot-swap capability is essential during maintenance of a highly available system, but it is even more important for implementing the inevitable adds, moves and changes.

Additional work is under way to leverage the Hot Plug effort into the hot-swap technology defined in the CompactPCI Hot Swap specification.

CompactPCI Hot Swap is the latest specification for PCI-based industrial computers, and defines many features that make a PC more available. The Hot Swap subcommittee within the PICMG is working to extend the CompactPCI specification to include support for hot swap. The PICMG consortium is hashing out an extension to the standard that will let users mix and match CPU boards and backplanes from multiple vendors.

The CompactPCI Hot Swap specification is currently in final draft and is being reviewed by members of PICMG.

The arrival of CompactPCI is enabling telecom service providers to deliver new, innovative services with the reliability the telecom network requires. Companies deploying CompactPCI-based high-availability platforms will be able to meet the telecommunications infrastructure market needs for intelligent network integration, including service nodes, service control points, signal transfer points and Signaling System 7 gateways.

There is also a large demand for cost-effective, high-availability wireless CompactPCI PC packages such as wireless local loop, cellular/personal communications services/personal communications network, trunked radio and in-building wireless PBX systems. Additionally, new alternate access carriers are looking for cost-effective ways to provide telephony to the home and provide a variety of central office-grade enhanced services.

Loonam is product marketing manager at Natural MicroSystems of Framingham, Mass., a provider of telecommunications equipment. She can be reached at Barbara_Loonam@nmss.com.

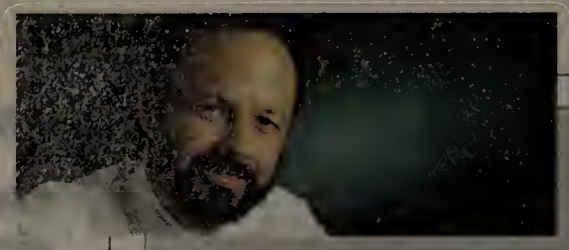
UP CLOSE

The CompactPCI specification

The idea behind the open CompactPCI specification is to provide high availability through hot swapping of multivendor PC components.

In the telecom realm, CompactPCI offers a host of features required for network applications, including:

- A standard telecom bus (32 streams and 4,096 time slots) for communications between cards in a chassis rack
- A telecom form factor with rear-panel I/O
- Transition cards and cabling assemblies to simplify installation
- Telecom power bus and provision for ringing voltage
- Hot-swap capability, which allows systems to be upgraded or expanded, or cards to be replaced without taking servers offline
- Software that's compatible with mass-market PCI systems
- Redundant power management, CPUs and disks
- No interruption of system operation if a subsystem module fails
- H.100 compatibility, which defines a standard, interoperable telecom bus, allowing developers to integrate newer H.100-based products with existing products



EDITORIAL *insights*

A resurgent FORE builds on its ATM philosophy

A year ago, amidst the swirling hyperbabble about Gigabit Ethernet, FORE Systems took it on the chin. FORE's financials and self-image dipped. The company was fighting an ATM religious war that got bloodier with each new Gigabit headline.

Things are different today. No, FORE hasn't given up on ATM. In fact, the ATM enthusiasm seems stronger than ever. But that enthusiasm has been leavened with a healthy dose of reality about how customers build networks. Through acquisitions and partnerships, the company has broadened its product line and is focusing on markets where ATM makes the most sense: high-end enterprise networks and the service provider arena.

FORE is offering an array of Ethernet and Fast Ethernet feeder switches into its ATM backbones and is planning an impressive rollout of WAN access and carrier-edge devices. That should expand FORE's presence in the lucrative carrier market, where service providers are re-architecting their networks to deal with the deluge of data traffic.

The company's financials are much improved, and its stock has climbed from less than $15 a share in March to $25 as of this writing. That gives new CEO Tom Gill more leverage in making acquisitions.

While the big network vendors all sound the "one-stop-shopping" market strategy, FORE represents a real alternative: It is committed to the idea that future-proof networks should be built on ATM. But by providing a greater range of Ethernet products, FORE has made it easier for customers to integrate frame and cell technology.

FORE certainly faces challenges. With an estimated $630 million in annual revenue, it is still a small fish swimming with some very big, hungry sharks, such as Cisco, 3Com, Lucent, Ascend and Nortel. FORE could be snapped up by, say, Lucent. FORE would shore up Lucent's small stake in the enterprise, and FORE's technology would complement the Gigabit gear Lucent gained in its Prominet buyout.

Gill says FORE wants to go it alone. Toward that end, I think FORE should bite the bullet and get Gigabit Ethernet and Layer 3 switching into its portfolio. It could do that by expanding its partnership with Intel, which already supplies Fast Ethernet gear, or by acquiring one of the remaining Gigabit start-ups.

FORE could position Gigabit for smaller backbones and for customers leery of committing — for now, anyway — to ATM. In short, FORE could still champion ATM while muting the thunder of the frame world's own best weapon.

John Gallant, editor in chief jgallant@nww.com

Intranet Adviser • Daniel Blum

For large users, outsourcing e-mail may make cents

If you think privately owned Lotus, Microsoft, Netscape and Novell products are the only choices for a mid-size or large enterprise e-mail environment, think again. The market for managed electronic mail, in which a company outsources its e-mail operations, is starting to take off.

For example, Wiltek, a managed e-mail provider based in Norwalk, Conn., has provided backbone messaging integration, directory synchronization and consulting services for some time. Wiltek relieves companies of the complex task of interconnecting disparate e-mail platforms, for as little as $8 per user per month in some cases.

CompuServe Network Services, now a subsidiary of WorldCom, recently raised the ante, entering the managed e-mail market with a new service called WANmail. WANmail consists of three offerings: WANmail/POP3, WANmail/Hub and WANmail/Relay.

WANmail/POP3 offers mailbox hosting from a server infrastructure located in CompuServe Network Services' secure data center. It provides a Web-based mailbox administration interface, allowing customers to add, delete and change user information. On the backbone side, WANmail/Hub provides managed Internet mail gateways, disparate e-mail system connectivity and dispersed, same-system connectivity. WANmail/Relay is a single gateway service between a user's proprietary mail system and the Internet.

WANmail/POP3 will be available this week starting at $3.50 per user per month, according to CompuServe Network Services. While customers still have to pay their administrators, cover help desk costs and fund the network, POP3-only services such as WANmail (or the equivalent operated internally) are cheaper than complex mail systems such as Lotus Notes or Microsoft Exchange on a total cost of ownership basis. WANmail/Hub and WANmail/Relay will be available later this summer.

Still, privately owned advanced messaging and groupware systems do provide a higher level of functionality than POP3 systems, outsourced or otherwise. If your enterprise is undecided about whether to make cost or functionality your highest priority, here are three ways to achieve an optimal cost/functionality trade-off.

First, you can stratify your user base. Plan to deploy high-function mail systems only to your knowledge workers, and provide users with simpler job functions, such as retail, order entry and manufacturing, with simpler POP3 clients and servers. Deal with a couple of different vendors and consider outsourcing for the low and/or high end.

Second, you can wait for today's low-end products and services to evolve. Today's POP3 systems are fast and robust, and interoperability problems are rare. The same cannot be said for newer, less stable systems based on the Internet IMAP4 messaging and LDAP directory standards. However, within a year or two, standards-based IMAP4/LDAP clients and servers should be almost as robust as their POP3 counterparts, and almost as rich as current high-function messaging products.

Third, you can lean heavily on the high end. Try to get your messaging vendor to offer you a package that includes outsourcing, user stratification and a significant level of responsibility for coordinating messaging deployment architectures with your network topology.

However, if you're ready to give up some of the richer groupware and workflow options that come with high-function messaging systems, using an outsourced solution such as WANmail/POP3 may be the way to go.

Blum is a senior vice president and principal consultant with The Burton Group, an IT advisory service providing in-depth analysis for network planners. He can be reached at dblum@tbg.com.

MESSAGE

Send letters to nwnews@nww.com or John Gallant, editor in chief, Network World, 161 Worcester Road, Framingham, MA 01701. Please include phone number and address for verification.

Be true to your schools

Regarding the feature "Gimme smelter" (July 6, page 41):

As a network administrator for a small public school district, I find it a disgrace that more companies aren't aware of the benefits of donating computer equipment to local schools. First, the company gains a nice tax deduction for its efforts. While that may not be enough to justify all the work of putting the donation together, the PR and goodwill from the community that results is something you can't buy through advertising and

Don't let competition stifle cooperation

Money changes everything. As many veterans of the Internet Engineering Task Force (IETF) will privately admit, over the past few years the commercialization of the Internet has increased the level of politics in the standards-making process. Ipsilon Network's decision in 1996 not to pursue standardization of its IP switching protocols is a case in point.

Likewise, ongoing industry consolidation has put additional pressures on the researchers and engineers who, in the past, tried to focus on the merits of technical proposals rather than on who submitted them.

But that was then and this is now. Consolidation has led to the rise of a few large players in a high-stakes game.

Consider how much the industry landscape has changed recently. Nortel's acquisition of Bay Networks has created a company that last year had $17.7 billion in combined revenue and a mission to deliver IP-based products for markets stretching from the local and wide area to carrier networks.

Meanwhile, Lucent — with $26.4 billion in revenue last year — continues to snap up companies, most recently acquiring Lannet, a subsidiary of Madge Networks that makes packet- and cell-based LAN switches; Yurie Systems, a purveyor of ATM access technology; and MassMedia Communications, a network interoperability software vendor.

Lucent is also expanding its presence in Silicon Valley, home turf of competitors Bay/Nortel, Cisco and 3Com. Last month, Lucent announced that Bell Labs would set up a new research operation in the valley. Lucent also plans to contribute $2.6 million to Stanford University's School of Engineering, an establishment with which Cisco has a long history.

There's no doubt that the competition is heating up. This new environment has already led to increased tension in some IETF working groups, along with lawsuits concerning patent infringement claims.

For example, Cisco and IBM have alerted the IETF working group that defined the Virtual Router Redundancy Protocol, a fail-over protocol for routers, that VRRP violates one or more of their patents. Many vendors, including Nokia, 3Com, Lucent and Bay, have decided to implement VRRP anyway.

The squabble over VRRP is understandable in light of the intense competition in the LAN backbone market. Vendors of Layer 3 switches and switching routers know that customers will hesitate to deploy these new devices in their backbones if they don't have the same fault tolerance and reliability as traditional routers.

For companies such as Cisco, Foundry Networks and a few others that have already implemented proprietary versions of such a fail-over scheme, this feature is a clear competitive advantage. For the rest of the vendor community, defining a standard for router fail-over was a market imperative.

If push comes to shove, patent lawyers will have to sort out this issue. Likewise, lawyers will be busy sorting out the claims and counterclaims resulting from the patent infringement lawsuit that Lucent filed against Cisco earlier this summer. In the suit, Lucent accuses Cisco of violating eight Lucent patents relating to technology associated with routers, frame relay and ATM network equipment.

Again, such competitive behavior is understandable, but it doesn't necessarily benefit the industry at large — particularly the IT community. The longer it takes for key technologies to be standardized, the greater the potential pain for everybody, customers and vendors alike. IT managers often defer deploying new technology until standards are set, slowing the adoption of these technologies. And for those who deploy prestandard technologies, moving to standard technology can be frustrating and costly.

In the past, vendors have been relatively willing to offer their intellectual property as contributions to standards efforts. The new era of competition threatens that model. Vendors may insist on licensing technologies to each other rather than proffer to a standards body something that provides a competitive advantage. This licensing approach runs counter to the IETF philosophy, which is based on openly available standards.

Alternatively, we could see a rise in the number of alliances that vendors form around particular technologies. In light of the reduced number of players on the field, this strategy could become popular. In any event, the flavor of the IETF and other standards bodies is likely to change as the trend of voice, data and video convergence continues, bringing the culture and personality of telephony-oriented firms into contact — and sometimes conflict — with those of traditional data network companies.

As the industry negotiates this new phase of growth, industry leaders need to assess how they can achieve "coopetition," that balance between cooperation and competition that former Novell CEO Ray Noorda made part of the industry's collective consciousness. Without such a balance, standards organizations will degenerate into forums for stalling, rather than advancing, standards. And without standards, you can kiss interoperability goodbye.

Petrosky is an independent technology analyst based in San Mateo, Calif. She can be reached at mary@mpetrosky.com.

self-promotion.

Second, a company that considers its local students to be "worthy" of its surplus equipment will create a pool of computer-skilled individuals who may end up as employees for that company. Having kids graduate from high school with computer skills will soon become a requirement in today's high-tech world.

Third, with the small (and sometimes nonexistent) technology budgets schools have, donations may be the only way to get technology into the classrooms. Some school committees that approve the budgets aren't cognizant of the role technology plays in our lives or simply cannot afford to spend the money.

My school accepts all donations "as is." If the unit is nonfunctional, we understand; it was never guaranteed to work. We will even pick up the equipment ourselves, thus easing the pain of the donation.

I hope companies that are considering donating their older equipment see that there are many positives in helping their local schools. A simple letter of intent sent to a school will no doubt begin a process of good community relations — something no company can have enough of!

Rob Bellville
Network administrator
Millbury Public Schools
Millbury, Mass.

VPN defined

Regarding Scott Bradner's column "How do you spell VPN?" (July 6, page 34):

Perhaps, in the university environment, 90% of IP traffic leaves the campus in the spirit of academic collaboration and tunneling may be the appropriate technology. But in enterprise networks, 90% of traffic stays within the enterprise over a network engineered for the appropriate performance levels.

Enterprise challenges in managing increasingly complex networks translate into a multibillion-dollar opportunity for virtual private network service providers.

We define a VPN as a managed service in which secure connectivity, management and addressing, equivalent to that of a private network, are provided over a shared public network infrastructure.

This definition is not driven by a single technology such as tunneling over the Internet, but by the broad needs of enterprise users looking for not only extranet and remote access solutions, but also for solutions for intersite backbone connectivity as well as ones that can handle all of their network needs.

While tunneling will be used extensively for the two former solutions, the service-level agreement requirements of the latter two can only be met today by a combination of Layer 3 VPN-aware central office routing (for scalability) and Layer 2 virtual circuit switching.

Tony Rybczynski
Director, strategic technologies and marketing
Nortel, Enterprise Data Networks
Ottawa

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Teletoons

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FEATURE

MANAGING YOUR OUTSOURCER

In it for the long haul

Mutual trust and flexibility are the keys to good partnerships between network outsourcers and clients.

By Lauren Gibbons Paul

As Ash Patel and his network outsourcer celebrate their fifth year together, Patel has some advice for his colleagues who are considering taking the plunge: Make sure your prospective partner is flexible enough to adapt to changing business and technical requirements before you make a long-term commitment.

GINA BINKLEY

"The agreement will need to change," says Patel, manager of information technology services for Aramark Uniform. A subsidiary of managed services giant Aramark Corp. in Burbank, Calif., Aramark Uniform for the past five years has outsourced its WAN to Digital's services group. Digital and its services group were acquired by Compaq earlier this year. The first contract between Aramark Uniform and Digital ran from 1993 to 1996; the second covered 1997; and the third extends until 2001.

Most comprehensive network outsourcing contracts last at least three to five years and are worth big bucks — tens of millions per year or more, in many cases. With the lightning-fast pace of change in business and technology, the parties can't expect to spell out every eventuality in the four corners of the contract. That makes the job of managing the relationship all the more difficult. Consider this your guide to forming a harmonious union with an outsourcer that ensures your needs will still be met as the relationship evolves.

The ties that bind

When you outsource your network, you trade one set of responsibilities for another. You must remain vigilant in ensuring that your vendors are providing the business value they promised at the outset. Your vigilance means constantly measuring provider performance with respect to service-level agreements (SLA), monitoring the market for price-performance improvements and speaking up if the contact person changes too frequently.

Despite the length of the average network outsourcing contract, companies often return to the bargaining table with their providers long before the formal renegotiation period begins — some even on a yearly basis. "We do an annual renegotiation of terms based on business need," says Nigel Bufton, vice president of business development and marketing for Compaq in Houston.

Bufton notes that a client is not entitled to cancel a contract just for convenience sake. "The vendor has to protect its investment. But we recognize that the chances of the same technology being used years down the road are very slim," he says.

Indeed, both parties benefit when you forge a relationship with your outsourcer that will stand the test of time. There's a lot at stake in the outsourcing arrangement, and it's notoriously difficult and costly to walk away from a contract before the term expires (see story, page 36). A high percentage of large companies are unhappy with their outsourcing providers but hang in there because the penalties of early cancellation are too high, says Marc Liebman, vice president at the Dallas consulting firm Everest Group.

Everest divides the life cycle of a network outsourcing arrangement into four phases: preoutsourcing, procurement, management and the exit or renewal phase. Not surprisingly, outsourc-

ing relationships usually fail at the management stage.

"The core reason most companies are unhappy is they can't measure the contribution the outsourcer is making to their business objectives," Liebman says. This results in resentment on both sides, and then things break down. But those failures are typically due to poor planning at the procurement stage. "The agreement was not properly scoped from Day One. Despite SLAs, most contracts simply don't have meaningful consequences in them," he says.

Escaping the blame game

Aramark Uniform's Patel knows that few elements of his outsourcing agreement will remain static. For one, his firm's network has changed dramatically during the course of its outsourcing contracts with Digital.

In 1993, Aramark had a point-to-point VAX-based DECnet WAN composed of Digital AlphaServers, routers and switches distributed across 80 U.S. sites. Today, the company is migrating to an AT&T frame relay network with Cisco hardware and plans to implement SAP America's R/3 enterprise resource planning package over the next few years. The uniform supplier also has gained nine sites via corporate acquisitions.

Patel says Digital [now Compaq] was more than willing to roll with his company's evolving business and technical requirements over the years. Even when Aramark Uniform planned the network upgrade, he says it never made sense to look for another outsourcer.

"We pride ourselves on business flexibility," Compaq's Bufton says. "We go in with the understanding that in a year's time everything is going to change."

Aramark Uniform's first three-year contract with Digital lacked SLAs and other milestones. "We didn't even think about SLAs. My boss didn't see a need for them," Patel says.

There was little cause for concern about SLAs because Aramark's management was clearly happy with Digital's performance. Under the outsourcing arrangement, the uniform manufacturer's network uptime leapt from 85% to more than 99%.

However, the arrangement wasn't perfect. Under the first contract, Patel retained responsibility for managing all the hardware, software and telecom vendors associated with the network. When things went awry, he was the one who had to sort out finger-pointing among vendors.

When the 1997 contract went into effect, Digital assumed responsibility for managing all the network vendors, right down to the local phone company. "[Compaq] handles all the vendors. That's not my problem. I went through that before, and it took all my time," Patel says.

Patel recently realized his firm's move to a centralized IT infrastructure would require him to build accountability into the contract via SLAs.

"The whole company will be running on a few machines. That means the network has to be up more, and we'll rely on it more," Patel says. "We decided to put in SLAs to make sure they would meet our needs going forward." For example, if one of the sites goes off the frame relay network, Compaq Services personnel must respond within 10 minutes or put some of Compaq's fees at risk.

BART BARTHOLOMEW

Ash Patel *of Aramark Uniform counts on Compaq's outsourcing group to adapt to his firm's evolving business and technical requirements.*

Attitude check

If marriages often fail due to issues surrounding money, outsourcing relationships go awry due to

Calling it quits

Network managers looking to cut short an outsourcing agreement face more heartbreak and financial strife than Bruce Willis and Demi Moore.

The fact is, neither side wins when there's a breakup between parties engaged in a long-term, multiyear deal. A client has to go through the pain of paying steep cancellation penalties and finding a new provider or taking the network back in-house. A vendor suffers the black eye of having a client unhappy enough to terminate the deal early.

Not surprisingly, most clients elect to merely live out the term and search for a new provider a few months before the contract ends.

A smooth, premature break from your outsourcer is generally not possible. "[The outsourcer] owns all the intellectual capital for your network. Do you know what it costs to learn everything about your network, hire people and retrain them? It's almost impossible to divorce your outsourcer," says Deb Mielke, a director at telecommunications management consulting firm TeleChoice in Dallas. The problem is even worse when the outsourcer is also acting as your ISP, she says: "Now what do you know [about your network]? Not a lot."

Still, a few companies are gaining visibility for instigating high-profile network outsourcing divorces.

Last September, chip maker LSI Logic cut short a five-year IT outsourcing arrangement with IBM Global Services. "When you outsource, you lose the linkage between information technology and the business. It made us very dysfunctional," says Lam Truong, chief information officer at LSI in Milpitas, Calif. The service-level agreements (SLA) LSI Logic had with IBM Global Services were irrelevant, and didn't measure the effect of network performance on the business — in business terms, Truong says.

So Truong bit the bullet, paid stupendous fines, and spent $18 million in-sourcing the company's network and IT infrastructure. The process took two years, but he believes he did the right thing. And he can see his way clear to the benefits he'll get from in-sourcing. "The ultimate goal down the road is to have the economic health of the company reflect the health of the network," he says.

LSI Logic paid the price and got out of its deal. But clients often find at the eleventh hour that the contracts they signed heavily favor the outsourcing provider in the event of a divorce, says Alan Gonchar, president of Compass America, a consulting company in Reston, Va.

"The vendor tends not to lose," Gonchar says. Because the contract itself is so complex, the client often prefers to ignore the language within it until it's too late.

To get out of a contract before the formal end date, Mielke says the customer must put together a solid business case for nonperformance of network services. Usually, this will implicate failing to perform up to levels specified in SLAs. Most contracts contain a provision that specifies the customer must give the outsourcer a "reasonable" amount of time in which to cure its nonperformance.

But Mielke suggests starting talks on the QT with other outsourcers before this period is up so as not to waste more time. "Play the game with them as long as possible, because as soon as they know you're going to get out, they'll start ignoring you," says Mielke, who admits that when she worked for an outsourcer, she neglected clients she knew were going to give her firm the boot. "It's just human nature," she says.

In network outsourcing, as in marriage, sometimes a divorce is inevitable.

— Lauren Gibbons Paul

money and personnel issues. A deal that looked good and fair on Day One can start to look pretty lousy as early as Day Two, says Alan Gonchar, president of Compass America, a consulting firm in Reston, Va. This problem crops up particularly in long-term network transport contracts that are subject to extreme pricing volatility.

"The clients start to feel they're being taken advantage of. They can see prices coming down, but they can't take advantage of the carrier price wars because they're locked in to a long-term deal," Gonchar says.

He advises IT managers to stipulate in writing that telecom pricing vary according to predefined market activity. A sample contract clause might say: "If market rates for coast-to-coast T-3 links drop by more than 10%, we have the right to renegotiate the deal, or we have the right to drop our hourly rates by 5%." "You want to be sure you've got a reasonable and fair deal," Gonchar says. He recommends that companies include in their contracts the right to conduct annual price and performance benchmarking and renegotiate prices annually based on the results.

A change in personnel — either on the vendor or the buyer side — is the other big reason relationships sour, says George Logemann, director of outsourcing consulting at The Yankee Group, a market research company in Boston. "The new manager comes onto the job with an agenda that is not consistent with the spirit of the contract," he says. In other cases, tension stems from garden-variety personality conflicts between parties.

Mark Hilden, chief information officer at insurance conglomerate Ace USA in Atlanta, has been burned one time too many by a change of personnel during an outsourcing contract. He has learned the hard way not to become dependent on any one person from the outsourcing provider, no matter how gifted or dedicated.

A few years ago, for example, his company was due to upgrade the database management software on a major production server. The night before the upgrade was set to begin, the outsourcing contact had a family emergency and had to leave.

The window of opportunity to perform the upgrade was tight — only a few hours — and the chance wouldn't come again for several months. The outsourcer assured Hilden that a replacement employee had experience performing that particular conversion, so Hilden gave the project a green light.

Needless to say, disaster ensued. "Not only did the replacement screw up the conversion itself, he also made things much worse for us by not following the basic precautionary steps that anyone who had done this before would have taken," Hilden says. For example, the replacement forgot to check the backup tapes to see if they were valid before he started the conversion. Once the conversion failed, the replacement had nothing to go back to.

"We lost months of work, and our ability to produce certain critical management reports was lost for almost eight months," Hilden says.

To protect his company from similar snafus,

SIGNS OF A GOOD RELATIONSHIP

According to Compaq Services officials, the longest lasting and most productive network outsourcing relationships share the following characteristics:

- **A good contract.** Both sides must actively work on the contract and understand it.
- **Clear metrics.** This is a stumbling block for many outsourcing agreements. SLAs must be in place, along with clear methods for measuring performance and immediate consequences if that performance is not met.
- **An atmosphere of trust.** The foundation of any successful marriage, trust is paramount.
- **An absence of culture shock.** Each side must train the other in its unique corporate culture.

A well-suited pair

The average network outsourcing contract is worth millions and runs for five years, according to outsourcing executives at Compaq. That information may lead you to believe that outsourcing is only for large companies with deep pockets, but it often makes a lot of sense for small and mid-size companies, too, especially when the outsourcing provider is also small.

It's not financially or practically feasible for Development Alternatives to do business without outsourcing its entire IT operation, says Larry Koskinen, chief information officer and vice president of the Bethesda, Md., firm. With a relatively modest $70 million in revenue and 300 employees, Development Alternatives helps grow the economies of third-world or war-ravaged countries such as Zaire and Bosnia.

The company's employees work in areas with no telecommunications infrastructure, so there's no possibility of simply extending a T-1 line and adding some network equipment to support each new area. To make matters worse, Koskinen's firm operates in a low-margin, government-subsidized market and doesn't have a lot of money to spend on technology.

"I don't have the capital to create my own bandwidth," he says.

So the CIO turned to Houston-based Interliant to provide network and help desk services worldwide. Unlike its big outsourcing brethren, Interliant doesn't require its clients to sign multiyear contracts. Development Alternatives has been using the outsourcer's services for two years on a year-to-year basis.

Although the contract doesn't contain service-level agreements, Koskinen says the arrangement works fine. "We've had an occasional glitch, but they've been very responsive," he says of Interliant. The outsourcing arrangement began as a personal business relationship and evolved because of a high level of personal interaction.

That kind of personal interaction was definitely missing from the relationship between Berkshire Partners, a tiny private equity investing firm in Boston, and a giant outsourcing company. Chuck Kabat, a systems administrator at Berkshire Partners, declines to name the well-known outsourcer but recalls the company's razzmatazz spiel about the benefits of its services. Because Berkshire Partners had no network at the time, Kabat had high hopes when he contracted with the outsourcer to install a small NetWare LAN.

"After we signed on, [the initial contact] totally vanished. It was an unpleasant surprise," Kabat says. He had no rapport with the new contact, who was hardly ever around and apathetic when he was. Even worse, the outsourcer refused to help move Berkshire Partners to an NT network several months later.

Kabat's boss had been reading up on NT and wanted to know why the firm wasn't moving in that direction. "We couldn't get an answer on why we did or didn't want to [migrate to NT]. They wouldn't even give us a proposal," Kabat says. "They were totally in bed with Novell. They didn't have any interest in NT, and we had no leverage."

Things got so bad after Berkshire Partners declined to sign a multiyear deal that the outsourcer contact stopped returning Kabat's phone calls, leaving him to deal with printer and server problems on his own. Finally, a desperate Kabat turned to an acquaintance who worked at outsourcing start-up OHC in Cambridge, Mass.

OHC solved Berkshire Partners' problems and seemed to genuinely care, Kabat says. OHC also agreed to work on a time and materials agreement, which suited Berkshire's needs perfectly. "We work harder on the relationship since it's not a sure thing," says Chris Stephenson, a vice president at OHC.

Kabat no longer uses or pays for the big-name outsourcer's services, but he has yet to officially fire the firm. He wanted to see how long it would take the company to get back to him, and it has been two years and counting.

"The relationship just vanished," Kabat says. "We were a pain in their butt."

— Lauren Gibbons Paul

MANAGING YOUR OUTSOURCER

Hilden made sure IBM Global Services' outsourcing unit was backed by solid, documented procedures before he signed his latest contract with the service provider.

As you evaluate potential outsourcers, ask to see a procedures guide. If the company doesn't have one, this tells you that the firm doesn't place much emphasis on institutional knowledge and procedures, says Hilden, adding that he wouldn't do business with such a vendor. If there is a procedures guide, assess it by examining major areas such as initial configuration or network segment restoration.

The only way an outsourcing customer can hope to achieve consistency across time zones and locations is if the vendor adheres to clearly defined procedures, Hilden says. "The worst thing you can have is something unexpected."

Apart from turnover, friction may result if your outsourcer doesn't offer you a single point of contact to manage the contract, says The Yankee Group's Logemann. While Hilden has learned not to get too attached to any one individual, he relies on a single point of contact and insists on creating a rapport with that person. But, he notes, "you have to have those strong procedures and policies to fall back on. The next person has to be able to step in and not miss a beat."

Just as turnover on the outsourcer's side can cause problems, your own staff changes also can upset the delicate balance of outsourcer/client relations. Oftentimes, the internal project manager will be promoted or quit and the replacement walks in with the attitude that the vendor is making too much money off the outsourcing agreement. This attitude is deadly, Logemann says.

"I want someone running the vendor deal whose cup is half full, not half empty, so he won't always be looking for a fight," he says.

Customers must expect the vendor to make a reasonable profit on the services it provides. "Some people apparently feel it is OK to squeeze more than the last nickel out of a supplier. But that's just what you don't want," Logemann says. "When vendors are squeezed, they have no choice but to reduce the quality or staffing levels of the delivery personnel."

If quality declines or something that threatens service delivery looms on the horizon, it's time to renegotiate — no matter where you are in the formal contract.

And if you intend to dump your current outsourcer and sign with a new vendor, you'd better start looking around well in advance of the contract's formal end date — about six to eight months before, according to Logemann. If you're going to invite several vendors to bid, "It takes 36 weeks from [a request for proposal] to contract signing — and that's at breakneck speed," he says.

The Yankee Group also defines a change in ownership of the outsourcing vendor as a gray area in which many client companies might wish to renegotiate (see graphic, above).

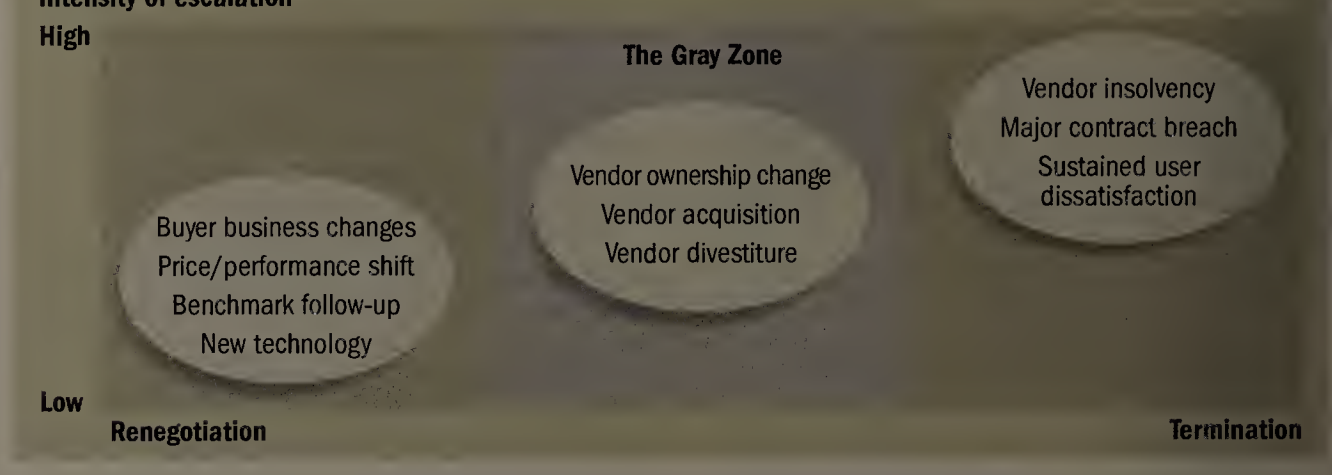
But Aramark Uniform's Patel isn't worried about the recent sale of Digital to Compaq.

"It's a great buy for both sides. For customers like us, it's one-stop shopping since we buy Compaq servers and PCs," he says. Time will tell if his optimism is well-founded, but at least he's Logemann's half-full kind of guy. After all, flexibility has to run both ways.

Paul is a freelance writer in Belmont, Mass. She can be reached at laurenpaul@sprintmail.com.

THE CONTRACT CHANGE CONTINUUM

According to Boston market research firm The Yankee Group, most network outsourcing deals get renegotiated at some point before the end of the contract. In Gray Zone situations, such as those in which the outsourcer's ownership changes, clients should be ready to renegotiate.



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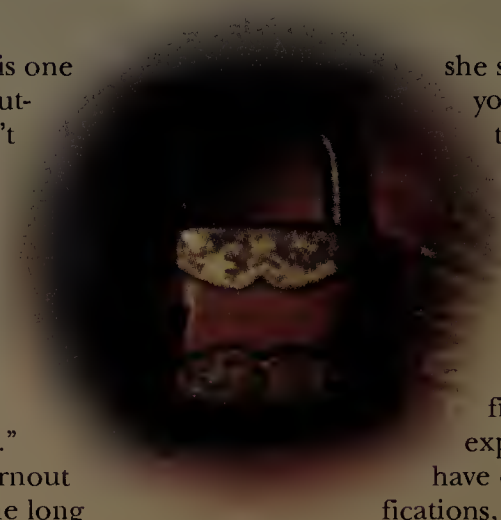
Gauging who's got the best people

The tight labor market for skilled IT professionals is one of the top reasons managers cite for turning to outsourcing. But how do you know outsourcers aren't feeling the crunch?

"[Outsourcers] run around telling everyone they have the best people, but the reality is they have just as much of a problem as anyone else" when it comes to attracting and retaining employees, says Deb Mielke, a director at telecommunications management consultancy TeleChoice in Dallas, and a former employee of MCI and SHL Systemhouse. "The only way outsourcers can retain the best and the brightest is with monster salaries."



Outsourcing professionals have a notoriously high burnout rate because their companies don't invest in them for the long run. Before you sign on with an outsourcer, get an accurate gauge of whether the company is investing in its people by visiting the office and judging the mood of the place.

Go to the network center and check out the outsourcer's equipment and network management tools, Mielke advises. "I want to see as much automation as possible and signs that they've made a capital investment," she says. "You also want to see they're not going crazy when you walk in. If [employees] appear a little stressed, they're probably a lot stressed. If you're talking to someone and his pager keeps going off, that's not a good sign."

Ask pointed questions rather than settling for blanket assurances that the outsourcing team is highly experienced. Find out how long the average tenure is, and when you're at the request for proposal stage, get copies of employees' resumes. Don't be alarmed if first-level team members have only two to three years of experience. However, the rest of the employees should have eight to 10 years experience and all the requisite certifications, Mielke says.

Mark Hilden, chief information officer at Atlanta insurance firm Ace USA, says outsourcing insulates him from human resources issues to some degree. That doesn't mean he ignores personnel issues, however. "I expect my vendors to have good solid hiring and retention policies for their staff, and I review those [policies]," he says.

— Lauren Gibbons Paul

REVIEW

BARDON DATA SYSTEMS FULL CONTROL 1.5 IS A WORLD CLASS SECURITY TOOL FOR WINDOWS 95 AND 98 CLIENTS.

Take control!

By Bob Currier

It's rare for a new company to hit a home run with the first version of a new product, but that's just what Bardon Data Systems does with Full Control 1.5, which earns our World Class award for its ability to secure Windows 95 and 98 workstations that are shared by multiple users.

Full Control provides administrators with the ability to specify what programs can be run by whom, and how long users are allowed to stay logged on. The software validates users at logon time and prevents them from running programs for which they aren't authorized and from changing or deleting configuration settings.

Full Control can also monitor and log all Web browser activity, giving administrators the ability to see just where their users have been surfing, and, if misuse is detected, to lock out questionable sites.

We spent several days testing Full Control and despite our best efforts couldn't find a way to bypass its security features. Installation was smooth, reporting was excellent and the clone feature, which lets you take a snapshot of a preconfigured workstation and then distribute the image to multiple systems, worked like a charm.

We had only one quibble with the package's security features, in the area of password verification. Windows 95 allows users to enter any password they choose, including their user name and other easily guessed words. Full Control has no facility to tighten password security or to perform a password table scan and report insecure passwords.

Configuring security settings is simple, or at least it was for us after we learned a shortcut. The first time we used the program we added users one at a time to Full Control before we set them up on the workstation. This seemed to confuse the program. The setup process is much easier when you first add users via the Windows 95 Users applet in the Control Panel. At that point, clicking on Full Control's User Setup button displays a list of known Windows users. You select the user you wish to modify, then configure the user's settings from a plethora of options.

You can specify which programs users may run, how long they can stay logged on, how they should be logged off when their time expires, which files they can view or execute, whether their workstation's CD-ROM door should be locked and more. We weren't able to think of a restriction or access-limiting feature that wasn't provided.

View our test methodology and download a demo copy of Full Control from Network World Fusion

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The number of settings and potential combinations makes Full Control's cloning feature particularly useful. With it, you can define a master configuration and then clone the settings to as many systems as needed.

For example, suppose you had a pool of PCs and a pool of temporary workers, each with a different user name and different assigned applications. Each temp might use any PC on any given day. You'd set up each user on one machine, then clone all the settings to either an installation diskette or a shared directory on the network, from which you could manually install the software to all the PCs in the pool. Full Control would then configure each user's desktop appropriately during logon.

We found cloning worked well. We were also pleased with Full Control's flexible reporting tools. You can opt to log all user activity to a file, then create reports that include user names, program names, the amount of time each task is used and the order in which events occur. You can also graph the top 10 items in a report as a pie chart. You can view and print reports based on entries in the log file, or you can view the log file data in a NotePad window.

If you need a report that isn't provided, Full Control allows you to define searches on all users or on individual users. You can also convert the text-based log file into a spreadsheet or database program.

Installation options are numerous, ranging from a manual install at a single workstation to unattended automated installation using command-line parameters within a batch file. The program won't install files without telling you where they're going, nor does it change any system files other than the registry. Full Control backs up the existing registry files at the start of each session, making it easy to roll back to the most recent settings.

The documentation supplied by Bardon consists of a black and white staple-bound booklet with the installation diskette attached to the last page. The manual is well-written and informative, but the appearance really detracts from the otherwise professional nature of Full Control.

Full Control is an excellent tool at any price and an amazing value at $49.95 per workstation. Its ease of installation, incredible number of configuration options and the unobtrusive way in which it works makes it a must-have for anyone who manages Windows 95 and 98 workstations.

Currier is director of data communications at Duke University in Durham, N.C. He is the recipient of Network World's 1997 User Excellence Award and an Honorable Mention in the 1997 Excellence in Campus Networking competition sponsored by CAUSE, a user group for computer professionals in higher education. Currier can be reached at (919) 660-6995 or robert.currier@duke.edu.

Currier is also a member of the Network World Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

Net Results

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PROS
- ▲ Easy to install
- ▲ Robust — couldn't defeat security
- ▲ Excellent report generation
- ▲ Able to clone master setup

CONS
- ▼ Uses Microsoft's weak password security which allows easily guessed passwords
- ▼ Documentation has "shareware" look

Score Card

Network World World Class	Effectiveness (40%)	Administration (20%)	Usability (20%)	Installation and configuration (10%)	Documentation (10%)	Total
Full Control 1.5	9 x .40 = 3.6	10 x .20 = 2.0	10 x .20 = 2.0	10 x .10 = 1.0	8 x .10 = 0.8	9.4

Individual category scores are based on a scale of 1 to 10. **Percentages** are the weight given each category in determining the **total score.**

Management Strategies

Outdoor paradise

The golf is great and there are lakes aplenty. It's Spokane — not yet a high-tech hot spot but warming up.

By Tom Duffy

The secret is getting out — Spokane is in. While network managers around the country are having trouble finding enough IT employees, in Spokane, Wash., the supply of talented technology workers generally outstrips demand. But high-tech jobs are starting to roll in as word gets out that the area is a haven for outdoor enthusiasts and folks who've simply had enough of overcrowded and high-priced high-tech hot spots such as Silicon Valley.

Boeing, Hewlett-Packard and Wang Global discovered the appeal of doing business in the Spokane area several years ago, while a skilled work force and plentiful labor supply have helped the city attract a bevy of new companies in recent years.

A number of firms have opened customer service centers in the area, including Cabletron, Sears, Pitney Bowes and Sallie Mae Servicing.

BF Goodrich's aerospace division will build a 130,000-square-foot manufacturing facility that's scheduled for completion next summer. And routing switch vendor Packet Engines relocated from California in late 1995 and now employs 185 people.

Chuck Fritz, *a network analyst with Principal Financial Group, doesn't regret moving to Spokane two years ago and enjoys the area's abundance of outdoor recreation.*

CRAIG SWEAT

California transplant P.J. Singh, vice president of engineering for Packet Engines, doesn't miss the Bay area's traffic jams and exorbitant cost of living. "I bought a new house that I never could imagine buying back there. And every time I go to the Bay area for a meeting, I can't wait to get out of there," he says. In Spokane, the median home price is just $103,900.

Chuck Fritz, a network analyst for Principal Financial Group, relocated to Spokane two years ago when the financial services company moved its 300-person pension administration staff there from corporate headquarters in Des Moines, Iowa. Fritz had never lived in the Northwest, but wasn't disappointed when he arrived. And while some folks eventually transferred back to be closer to family members, Fritz has no plans to leave any time soon.

"There are a million lakes to go fishing, boating or water-skiing on and I don't think the camping here can be beat anywhere," Fritz says. "I've never heard of anyone leaving this part of the state because they didn't like it here."

Located about 300 miles east of Seattle, the Spokane area has plenty of fans. While the city itself is small, the region stretches east across the border to include Coeur d'Alene, Idaho, and is home to upwards of 500,000 people. *Outlook Magazine* this year added Spokane to its list of 25 "choice" cities to live in. *Golf Digest,* meanwhile, noted that Spokane offers a better selection of affordable, challenging municipal golf courses than any other place in the country.

Unlike Seattle, Spokane has a four-season climate and gets about half the rainfall that its sister city across the state receives. The downside to Spokane is that finding an IT job is even more challenging than the area's golf courses.

Rene Reighard, a network administrator for Kaiser Aluminum and Chemical in Spokane, moved to the city more than two years ago from the resort town of White Salmon, Wash. Reighard heard about the job from a colleague in the aluminum industry and considered herself lucky to get it. "It's definitely one of the best employers in town," she says.

Recruiting managers say demand for sophisticated technology and network employees is fairly limited. "To date we've been successful in attracting local talent, though it's becoming more and more competitive," says Lori Kory, human resources director for Dakotah Direct, a call center service bureau in Spokane. However, Kory has had to advertise in diverse markets to fill a few specialty positions.

Spokane's unemployment rate hovers around a healthy 3.7%. But Mark Turner, president of the Spokane Area Economic Development Council, says the figure masks a high level of underemployment created by the region's heavy reliance on service-oriented businesses such as health care and retail establishments. The underemployed are those who are overqualified for the low-paying jobs they hold.

High-tech haven

The only major city between Seattle and Minneapolis, Spokane provides services to a regional population of about 1.5 million. As a result, Turner says businesses moving into the area often have no problem filling positions in spite of the low unemployment rate. "Most of those technology-oriented businesses are not hiring people from ranks of the unemployed but from the ranks of the underemployed."

Spokane also has developed something of a sub-specialty in call centers. Chances are, for instance, that when you call Microsoft with questions about Windows 98, you'll be talking with someone at Software Spectrum, a Dallas-based contract call center that recently opened a Spokane branch.

As Fritz and Singh have found, Spokane's affordable housing and desirable quality of life are big draws. With a population of 188,000, Spokane doesn't have much traffic. But it does have metropolitan attractions such as a symphony and opera company. Downtown, workers and shoppers can stroll through a 16-block area connected via skywalks. The $110 million Riverfront Park Mall, located along the scenic Spokane River, is scheduled to open in the fall of 1999.

Outdoor enthusiasts will enjoy the 78 lakes that are within a two-hour drive. Skiers have to drive only a bit farther to take advantage of several Canadian ski slopes and the buying power of the American dollar.

"If you're a person who likes the outdoors, there's probably no better place to live," says Kevin McDowell, a recruiter for Humanix Personnel Services in Coeur d'Alene. "There's boating, fishing, hiking, backpacking, mountain bike riding, everything and anything for the outdoor enthusiast."

Duffy is a freelance writer in Northampton, Mass. He can be reached at tduffy62@compuserve.com.

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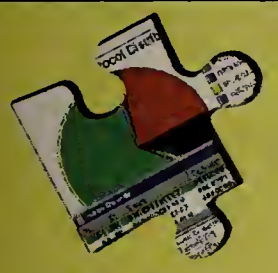

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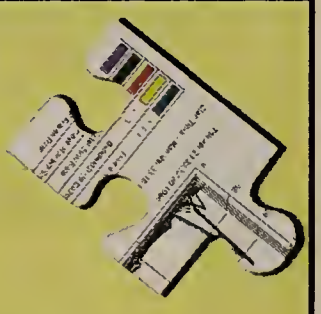

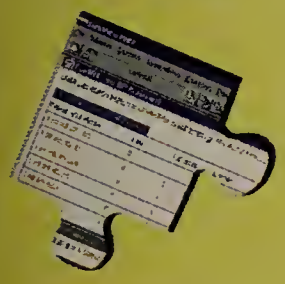

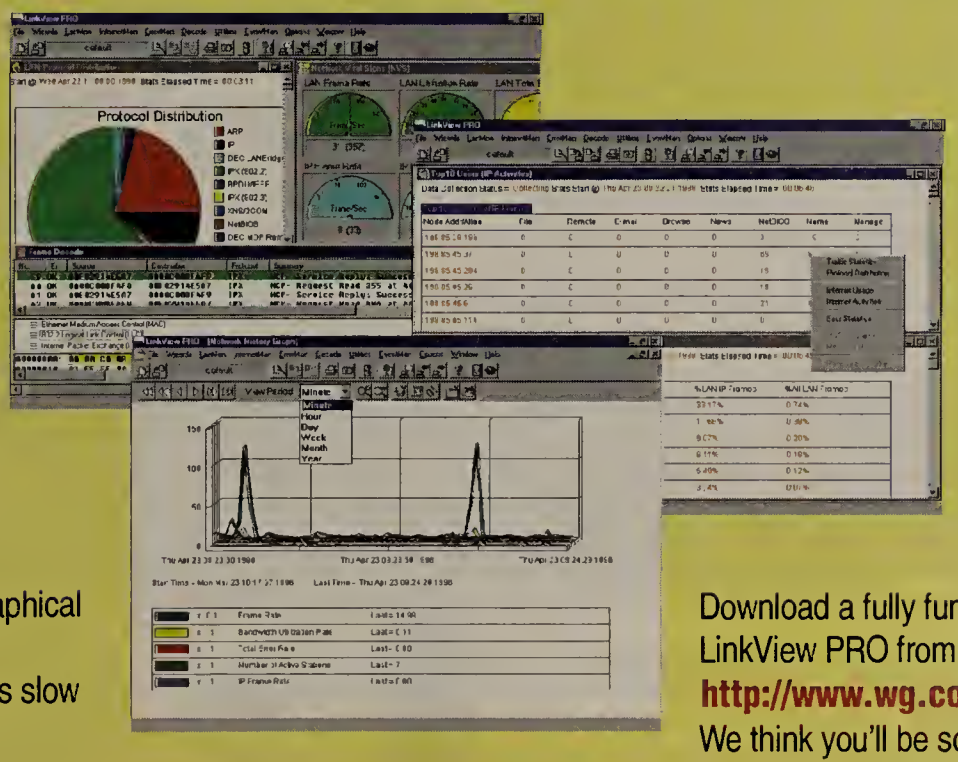

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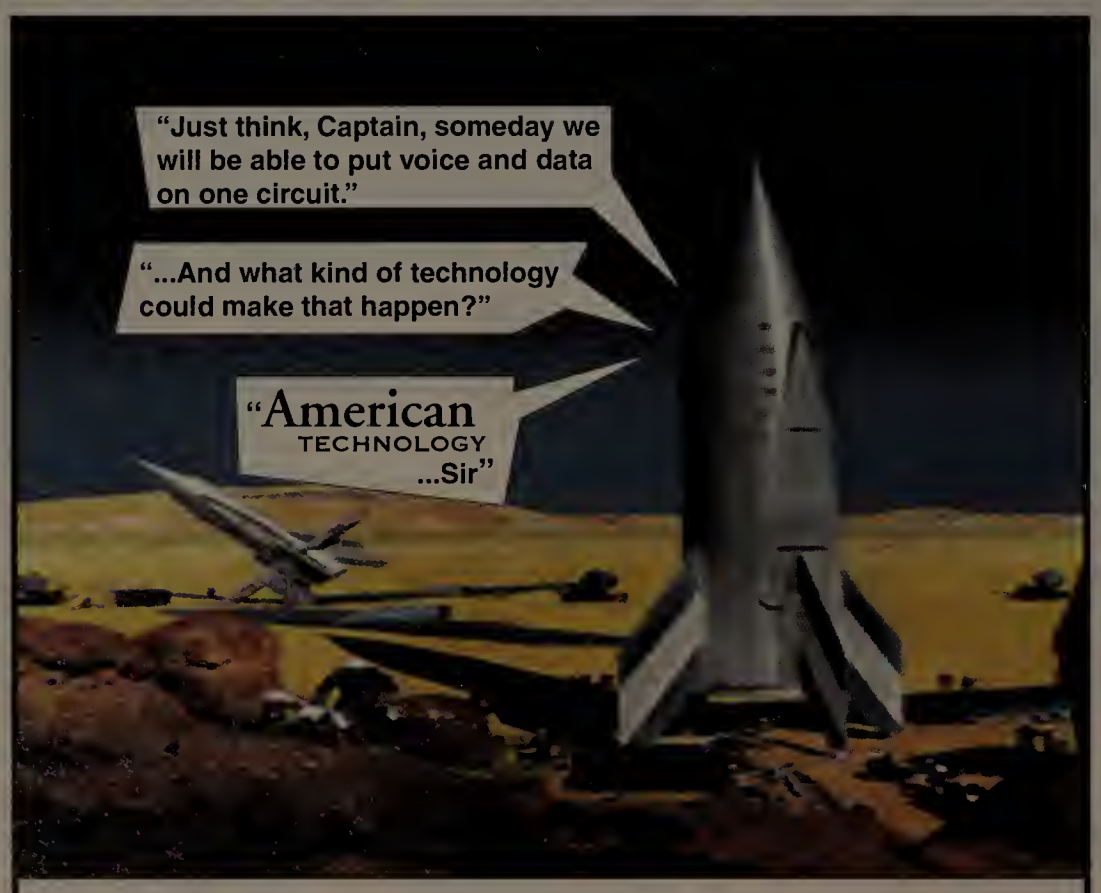

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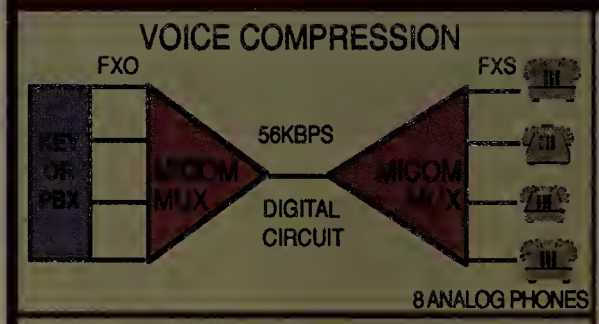

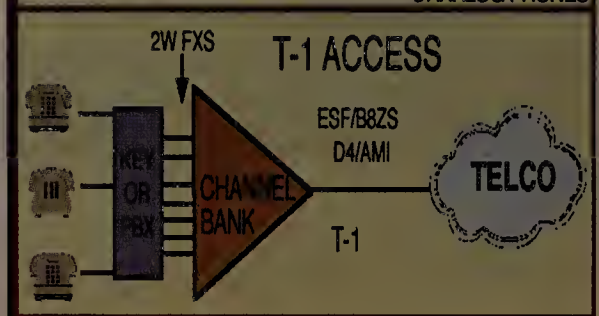

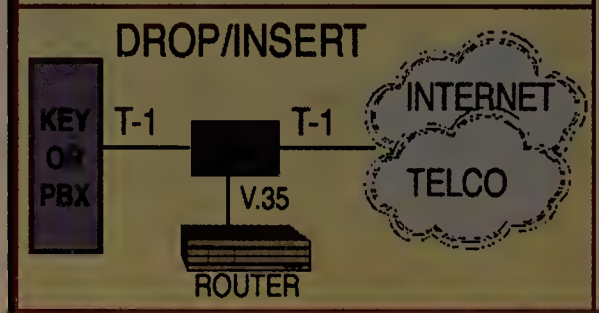

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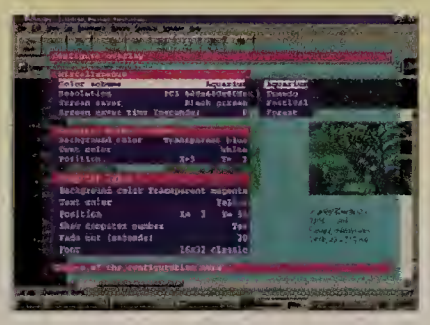

On-screen display menu–This screen shows the overlay menu with the selection for the color scheme popped up.

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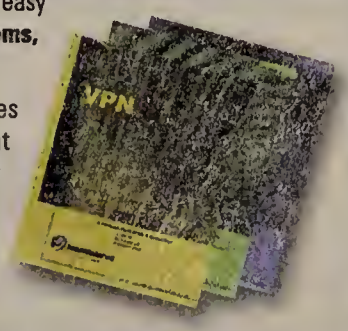

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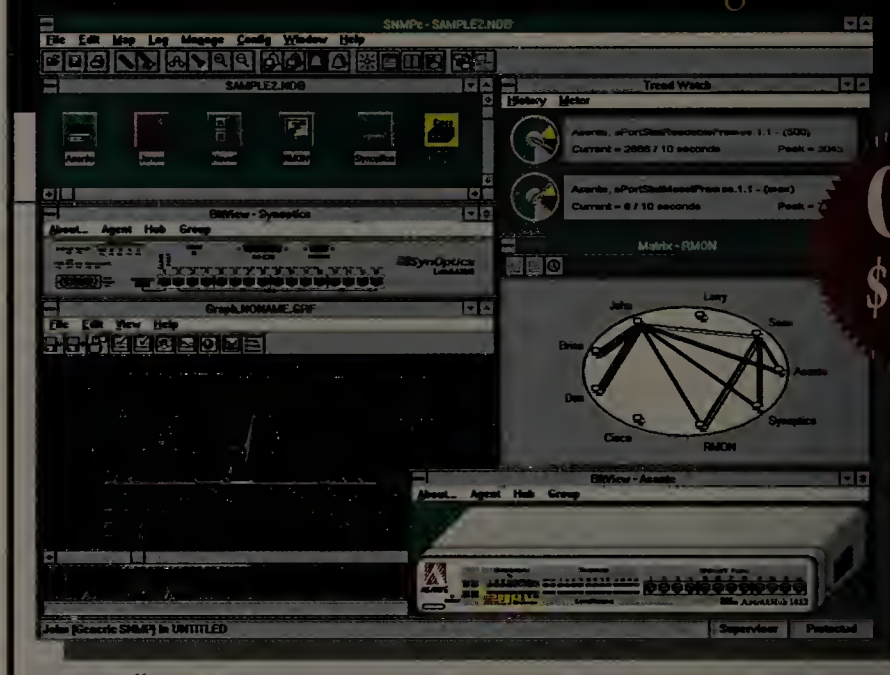

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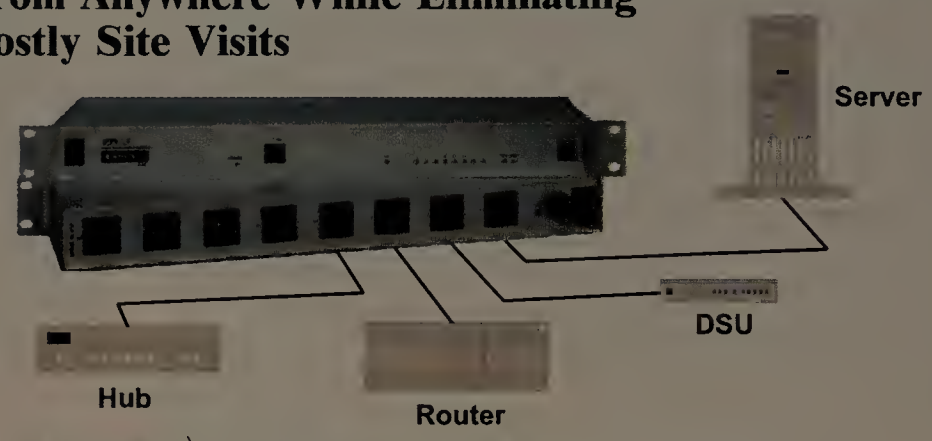

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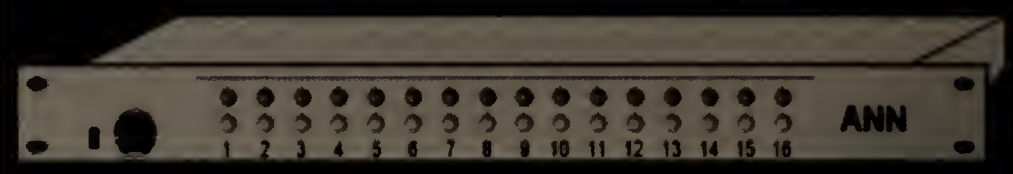

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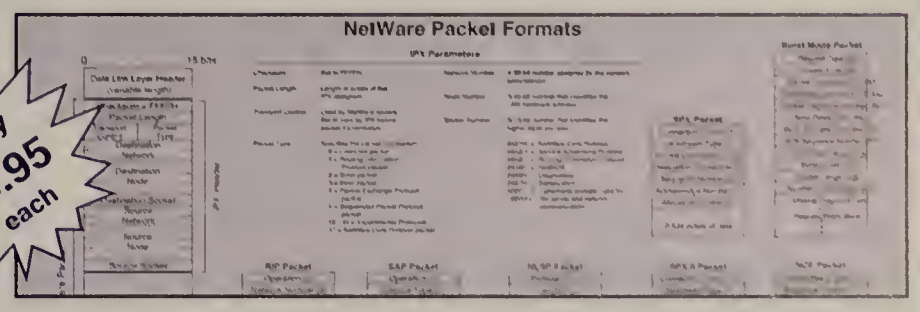

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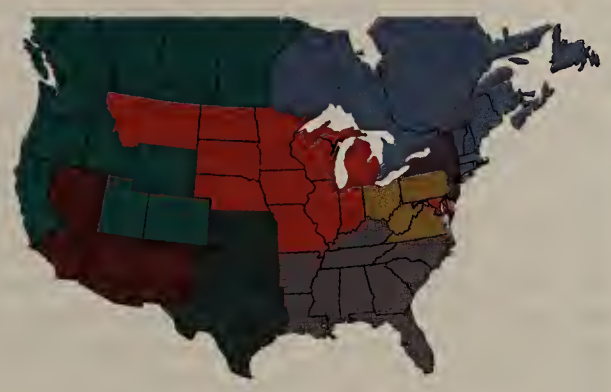

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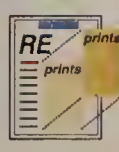

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Bell Atlantic/GTE

Continued from page 1

turn it into three and tell me that I have more choice. That is easy math," said Robert Rosenberg, president of Insight Research, a telecommunications research firm in Parsippany, N.J. But he acknowledged it is probably too late to stop the trend.

The latter sentiment is shared by some users. "I anticipate there will be five or six truly global carriers that offer a full range of services," said Phil Evans, senior telecom consultant with Perot Systems.

But others say that when mergers work, the whole can be greater than the sum of the parts. That's why PBS, which operates 350 television stations around the world, is looking forward to Bell Atlantic merging with GTE, said Dave Drucker, senior director of global technology at PBS headquarters in Old Town Alexandria, Va.

"We were entertaining the idea of using Bell Atlantic as our second ISP. If they merge with GTE, we would get an even stronger ISP," he said.

Still, customers that have been through them say mergers aren't all they're cracked up to be. For example, carriers that offer multiple services should be able to offer a single, simple bill. But since Bell Atlantic merged with NYNEX, Bell Atlantic's bills have become more confusing, said Sharleen Smith, director of new technology at USA Networks, a New York-based television network.

"[Traffic is] being metered all over the place, and I think users are getting hosed. No, I'm not looking forward to another merger," Smith said. And it might get even more messy when and if Bell Atlantic is given the green light to offer long-distance services.

Concerns may be a bit premature, though. This latest deal cannot go through until the Federal Communications Commission signs off on it, and FCC Chairman William Kennard seems to have reservations about whether the Bell Atlantic/GTE merger will promote choice.

"I hope the parties will demonstrate how this merger advances the pro-competitive thrust of the telecommunications act," Kennard said.

Despite the chairman's reservations, it will be hard for the FCC to say no to this deal because the commission has already approved other RBOC deals. SBC Communications has swallowed up Pacific Telesis and plans to consume Ameritech. Similarly, Bell Atlantic has already devoured NYNEX, leaving US WEST and BellSouth as the only original RBOCs still standing alone.

The merger has another troublesome aspect, according to Steve Sazegari, principal with Tele.Mac, a telecom market research firm in Foster City, Calif. Bell Atlantic is forbidden from selling long distance until the carrier proves it supports local-access competition, but if Bell Atlantic buys GTE, the purchase will include GTE's long-distance business.

A Bell Atlantic spokesman said that problem could be resolved by putting the long-distance division at arm's length from the rest of the merged company. Also, by the time the FCC could approve the merger — in 12 to 18 months — Bell Atlantic might have already won permission to sell long distance, the spokesman said.

Sazegari also noted that GTE competes directly against Bell Atlantic in a few markets. With the merger, Bell Atlantic eliminates a deep-pocketed competitor.

If the merger does win approval, it will create a $53 billion company with an imposing presence. Bell Atlantic occupies the lucrative Atlantic seaboard from Maine to Virginia, and GTE has a local presence in some 28 states, although some of that territory includes small cities and sparsely populated regions.

Together, the merged companies will have:

- Customers responsible for generating 30% of all international phone traffic.
- Local assets in 81 of the top 100 U.S. telecom markets.
- Outposts in 30 countries.
- Wireless holdings that would make the company the largest cellular carrier in the U.S., with 10.6 million customers.

Bell Atlantic promises to build a high-speed fiber backbone to support both voice and data, which would complement the long-distance service GTE sells today.

Both Bell Atlantic and GTE already offer a range of data services, including dedicated lines, frame relay and ATM, and they promise more. For example, GTE has run some extensive trials of high-speed digital subscriber line technology, which Bell Atlantic has also tested.

Last year, GTE acquired BBN Planet, a national ISP. Today, BBN Planet is called GTE Internetworking, which is in the process of deploying a new OC-192 nationwide Internet backbone. Bell Atlantic essentially resells the services of other national ISPs.

With such impressive credentials, the new Bell Atlantic could pose problems for upstart carriers trying to compete in local markets. But according to company executives, the merger would be good for competition — between Bell Atlantic and the other emerging supercarriers.

"The combined enterprise will have the financial, operational and technical resources to compete against AT&T, SBC/ Ameritech, WorldCom and others," said Ivan Seidenberg, CEO of Bell Atlantic.

That kind of clout is welcomed by corporate users such as Thomas Magee, network operations manager of Mentor Graphics, outside Portland, Ore., and a GTE local customer. "When [Bell Atlantic is] ready to compete with AT&T and MCI, at least nationally, I think we would put them on the list for our bidding process," Magee said.

In the meantime, GTE remains a local carrier in Magee's mind, and "local exchange carriers don't tend to be the most central factor in what we do. They are like a necessary evil to get to AT&T," Magee said.

This merger could also benefit companies that want end-to-end service-level guarantees for their WANs, according to John McFarlane, CEO of Software.com, an Internet applications developer in Santa Barbara, Calif.

"This merger is good because we have GTE service in California and Bell Atlantic in Lexington, [Mass.]. This will give us one provider. A service-level agreement can only come from one vendor," McFarlane said.

Using multiple carriers also lends itself to finger pointing when trouble arises, he said. "Right now, if there's a problem with service, it could be GTE, it could be Bell Atlantic, it could be MCI," McFarlane said.

Some customers, including Mel Beckman, director of network operations at the Systems and Software Consortium in Santa Barbara, Calif., and a GTE customer, are less than keen about dealing with a Bell operating company.

"If I were to use a Bell company and I had a problem with service, it would take me five to 10 hours to get a response. At GTE, they say, 'Hi, Mel!' They just have a great relationship with customers," he said.

Despite these worries, when the dust settles the competitive picture will be favorable to customers, PBS' Drucker said. "I think there will be enough players left after all of the mergers that competition will continue to grow. I would be surprised if it would actually go back to the days when AT&T was the only choice." ■

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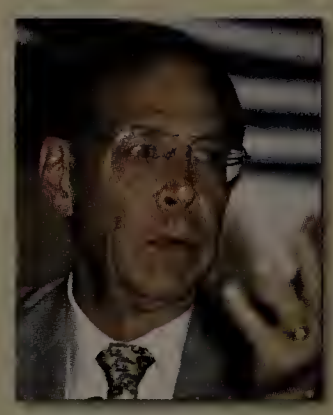
BELL ATLANTIC+GTE

Ivan Seidenberg, Bell Atlantic CEO



Charles Lee, GTE CEO

PROFILE: Bell Atlantic

Founded: 1984 (with the divestiture of AT&T)

Headquarters: New York

Employees: 141,000

1997 Revenue: $30.19 billion

Major assets: Owns most of the local loop from Maine to Virginia; 41 million access lines; telecom investments in 23 countries.

PROFILE: GTE

Founded: 1918

Headquarters: Stamford, Conn.

Employees: 114,000

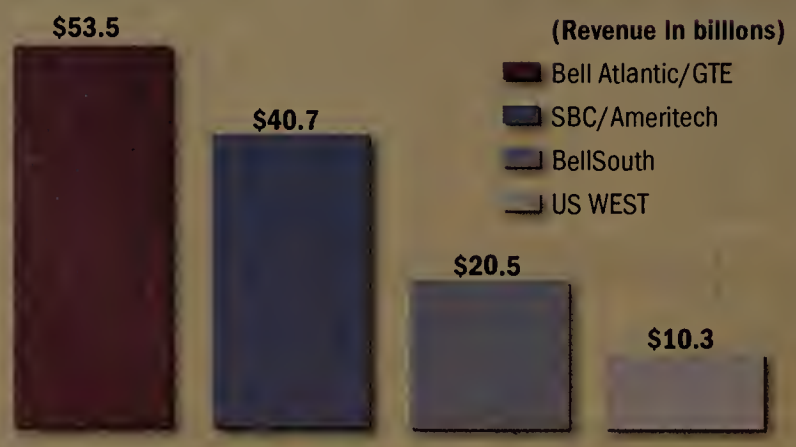
1997 Revenue: $23.26 billion

Major assets: 21 million local and 1.7 million long-distance customers; former BBN Planet Internet access network; extensive foreign telecom holdings.

"This merger is good because we have GTE service in California and Bell Atlantic in Lexington, [Mass.]. This will give us one provider."

John McFarlane, CEO of Software.com

LOCAL PHONE KINGS



PHOTOS (TOP): STEVE BORNS

Java

Continued from page 1

Forum, the group will present Sun with a wish list of changes for Java, posing a critical test of the company's willingness to overhaul a core technology to meet high-tech demands.

Can't do the math

At present, Java can't handle arcane-sounding math functions such as floating point, complex numbers, two-dimensional arrays and operator overloading. The functions are accommodated in languages such as Fortran that are used by programmers for engineering applications.

This means that Java, a great substitute for Common Gateway Interface scripts in server-based processing, doesn't find much of a role today in financial modeling, oil-reservoir simulation or physics engineering.

"Java doesn't have features to support these advanced capabilities," said George Thiruvathukal, a computer scientist affiliated with Loyola University and Argonne National Laboratory. He said in some cases Java's deficiencies can be traced to the Java Virtual Machine (JVM) or to Java's method for sharing data remotely, the Remote Method Invocation (RMI).

In spite of its shortcomings, Java has enormous appeal to engineers and researchers because it's a programming framework that lets them develop network-aware applications that are write-once, run-anywhere.

"We have the same portability problems as everybody else," explained Ron Boisvert, research scientist at the National Institute of Standards and Technology. "Although workhorses like Cray [supercomputers] are still in use, more and more scientific processing is being done on [Reduced Instruction Set Computing] servers as parallel machines."

Because of this trend, high-speed engineering applications often need to be ported from one platform to another, and that's where Java could help a lot.

Sun's Gosling *has acknowledged Java's performance problems.*

The high-speed computing world is eager to use Java, Boisvert said. "It's new enough that if there are problems with it, we can influence change," he said.

Added Jack Dongarra, computer science professor at the University of Tennessee: "Today, Java is not seriously being used in scientific computing, and Java Grande is an attempt by the community to pose ideas to Sun in the hopes that it eventually will."

To that end, Thiruvathukal, along with Geoffrey Fox, a computer professor at Syracuse University, earlier this year organized the Java Grande Forum to give some of the brightest minds in the computing arena the opportunity to come up with proposed changes to Java that will foster its use in advanced engineering.

Drafting demands

At this week's meeting, expected to be attended by representatives from more than two dozen academic and research institutions and from companies such as IBM and Intel, the Java Grande Forum will seek to nail down its Java-improvement demands based on a completed draft document.

The draft is expected to be a long list that would require an overhaul of the JVM, the addition of the IEEE floating-point standard, a new notion of lightweight objects, functions for vectors and matrices, and a new application framework based on a faster message-passing interface than RMI to satisfy parallel-computing needs.

Based on earlier discussions with Sun, which has quietly posted its own tentative ideas for change on the JavaSoft Web site, the Java Grande Forum's wish list "is more of an ambitious idea" than Sun may immediately be willing to accommodate, Thiruvathukal acknowledged.

Eager to keep the brainy Java Grande Forum in the fold, Sun has mustered a diplomatic effort led by Sia Hassanzadeh, Sun's senior business developer for high-performance computing, to negotiate inevitable change.

Finished by fall?

"They are certain to have a long list, but we want to build consensus," Hassanzadeh said. While Sun naturally hopes the group's demands can be met by simply adding some new APIs to the Java library, he acknowledged more fundamental changes to the JVM may be required — in essence, a new version of Java.

Sun and the Java Grande Forum by November hope to finalize a list of changes for public presentation at the Supercomputer '98 conference, with the wider Java community hearing about Sun's plans at the next JavaOne conference, in the spring of '99.

While the influence exerted by the Java Grande Forum may lead to the positive evolution of the technology, some in the research community are critical of the group.

"Java has already been developed to accommodate our distributed computing requirements," said Mani Chandy, computer professor at the California Institute of Technology. He praised Sun's new technical effort, called Jini, which is intended to provide a new way to remotely run applications using Java.

"We don't need to put all this pressure on Sun," Chandy concluded. ■

IBM

Continued from page 1

prototype here at IBM's Watson Research Center, eventually could help enterprises eliminate single points of failure.

IBM has not formalized product plans for the server software, but is looking throughout the company's divisions "trying to find a mother and father to have this child," said Tal Rabin, an IBM researcher. Rabin and a team of a half-dozen co-workers have been working on SDS for the past four years.

Copies are key

The key to SDS is that it divvies copies of data and distributes the pieces among servers using complex algorithms rather than simply replicating full copies of the data across machines. This technique not only uses less memory on each server, but makes it harder for anyone to steal the data in its complete form. And even if data is lost for good on one machine, a complete copy of that data still would exist among other healthy servers.

In a sample five-server setup, any three machines could provide a complete reconstruction of an original file in the event of a hack or crash "that mutilates the data or destroys it," Rabin said.

The likelihood of three or more servers going down at once would be slim, given that users would be able to distribute the servers across a LAN or WAN, she said.

The number of servers used in a customer configuration could vary, Rabin said. To date, IBM has been testing SDS over a three-server LAN that features RS/6000 SP Unix machines and clients running Netscape browser software.

Rabin suspects that data-access speeds would naturally be slower over WAN connections. She said the software should be able to work across any operating system.

Security policy

IBM has developed complementary technology, dubbed Proactive Digital Signatures, designed to protect security keys, digital certificates and even digital money against hacker attacks.

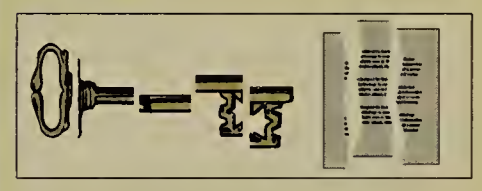
This software regularly scrambles the distributed data on each server so even if a hacker were to access data from one server, that data would no longer match data on other servers by the time the hacker could break into those machines.

"Everything a hacker learned Monday would not be usable on Tuesday," Rabin said.

IBM's SDS and related software could be a building block for storage-area networks, said Martin Reynolds, vice president of technology assessment at Dataquest, a San Jose, Calif., consultancy. He said the software could appeal to banks and other companies with tight network security policies. ■

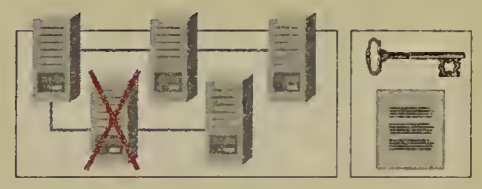
Keeping files and keys safe

IBM has designed its Secure Distributed Storage technology to ensure that information will be available even in the event of a server crash or hacker attack. Here's how it works:



1. IBM's server-based software breaks up files and security keys.

2. The pieces of the files and keys are distributed across multiple servers.



3. In the event of a system crash or hack, IBM software on the healthy servers fully reconstructs the files and keys.

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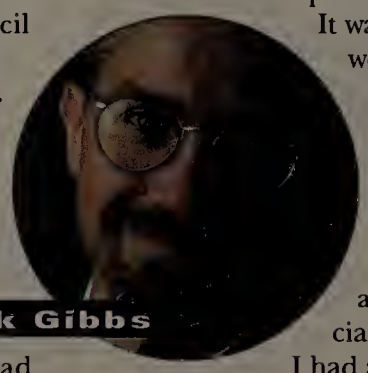
Backspin

The shock of the new house



About three years ago, I wrote a column that started, "We're moving. Again." Now I can write, "We've moved. Again." And, as with the last move, I was away for the whole thing.

I left one house, stayed in New Zealand for three days, gave a seminar and then a presentation to the Manakau City Council for a day, and returned home to the new house. Thus, just more than a week ago, I appeared at 5:30 p.m., slightly jet-lagged, and entered the maelstrom of moving. My wife, the long-suffering light of my life, had everything under control. Everything except for the phones, which had been one of my tasks.

Now, I had arranged all of the telephone changes well before we moved, but, no, Pacific Bell couldn't get its act together. So for the first two days in the new house, we had no working phones. But the gem was today when I discovered that 12 days after moving, the telephone number PacBell gave me for my fax line was wrong.

I called the number I'd been assigned and spoke to a charming lady named Vanessa who owns a cat named Shiva. She seemed quite relaxed about it.

PacBell's service operator was quite pleasant and offered to halve my installation fee as compensation. Hmmm. Seventeen dollars and 50 cents as compensation for telling people the wrong number for four weeks and then having to reinform all of those roughly 400 contacts of the correct number. I took the offer. What other justice was I going to get?

But the big excitement was when I attempted to reassemble my network. I narrowly escaped death. My first job was to get a minimal system running so I could pick up my e-mail. That happened four days after moving in, and I was able to retrieve the 405 waiting messages. What joy.

It was as I set up the net that I got a shock, a full 110 volts. "Darn it," I said (or an approximation thereof), and unplugged the offending machine. I couldn't find anything wrong, so I figured that as the machine worked otherwise, I'd just sort it out later.

Imagine my surprise when I assembled the rest of the network. I got a couple more whopping shocks.

It was then that the light went on —"Ah-ha," I thought, "I must have a live ground." I called my ace realtor, Judy, who called my ace builders, Artisan Designs, who sent around the ace electrician, Tony, who confirmed I had a "hot" earth and could have nicely fried myself.

Tony's home inspection identified a number of sockets that had live and neutral reversed. Well, under normal circumstances that would be no big deal. But the new Gibbs Towers was built in 1920, and what didn't they have in those days? If you said MTV, Leonardo DiCaprio or grounding, you would be right. If you said Strom Thurmond, you'd be wrong.

So when the electrical systems of old houses are modified, what do they do? They tie the neutral and ground together. But if they've swapped neutral and live, then what do we have? You've got it . . . a live ground.

Tony messed around with the sockets, and all was well. Well, almost . . . I now have a floating ground that's around 30 volts and somehow the Ethernet cable seems to have 120 volts running through it, but otherwise all is fine. Just don't touch the network cabling if you come 'round.

All will be fixed when the office is rewired next week. In the meantime, the home inspection chaps have some explaining to do, and I have to watch what I grab hold of. What with wrong numbers and live equipment, it's been an interesting first couple of weeks in Gibbs Towers. More next week . . . if I survive.

Moving tales to nwcolumn@gibbs.com or (800) 622-1108, Ext. 7504.

'NET BUZZ

The latest on the Internet/Intranet industry

GEMSTONE TO SERVE UP AN IPO One of the fun games in Silicon Valley these days is guessing which start-up in the hot Web applications server market will be bought next by a larger vendor.

In the wake of **Sun's** purchase last month of **NetDynamics** for a reported $160 million to $170 million (along with **Netscape's** buyout of **Kiva Software** for an estimated $180 million last November), any number of Web apps server vendors are rumored to be shopping for a cashout.

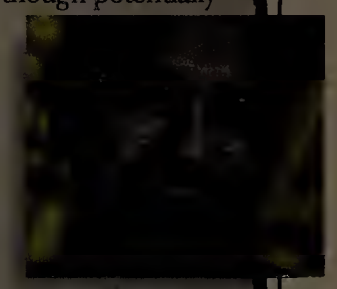
WebLogic, SilverStream Software, Novera Software, GemStone Systems — I've heard something about them all.

Well, it looks like you can scratch GemStone off the list. The Beaverton, Ore., company has filed for an initial public offering of stock with the Securities and Exchange Commission. GemStone plans to sell 2.5 million shares for $10 to $12 per share.

The company is banking on its GemStone/J Java application server, which it released last September after previously focusing on applications written in Smalltalk.

On the plus side, the company gets high marks from analysts for the quality of its server technology. Also, though GemStone has lost anywhere from $6.8 million to $8.3 million in the past three fiscal years, it has cut those losses to $1.2 million in the last two quarters.

On the minus side, GemStone is in a highly competitive, though potentially lucrative, market. Besides competing with other start-ups, it must battle **Sun, Netscape, Oracle** and **BEA Systems. Novell** or **Hewlett-Packard** also could enter the fray if one of them buys WebLogic, the hottest current rumor.



Chris Nerney

CAN PLASTIC SURGERY BE FAR BEHIND? In June, it got a new name. Last week it got $7 million.

No, **Acuity** isn't entering a witness protection program. It's just that the Austin, Texas, Web chat and real-time communications software start-up has a lot going on these days.

The $7 million investment comes from several sources, including **GE Capital's Equity Capital Group, OnSet Ventures, Sony Music Entertainment** and **Vector Capital.** The investment brings Acuity's venture funding total to more than $20 million.

The name change comes from a desire to begin attracting more corporate users. Acuity was formed in 1995 as ichat and focused on developing chat software for the Internet consumer market.

To show it's serious about the business market, Acuity in late June rolled out software that allows companies to offer their customers online, interactive support and electronic commerce. The product, WebCenter, is being tested by several major corporations, including **Charles Schwab** and **Harte-Hanks,** and sells for $125,000.

HELPING YOU POUND THE CYBERPAVEMENT There was a time when looking for a job meant spending hours scouring newspaper ads, working with fast-talking headhunters and bulk-mailing your painstakingly fabricated resume.

Now merely by getting online, you can instantly find exciting professional opportunities around the globe and, with a few simple clicks of a mouse, e-mail dozens of copies of your painstakingly fabricated resume.

A company that runs one of the largest such online job sites has announced its fourth round of venture funding. **CareerBuilder** of Reston, Va., has closed a $5 million investment round with **FBR Technology Venture Partners.**

Founded in 1995, CareerBuilder previously received $7 million in funding from **Thomson Publishing, 21st Century Venture Partners, New Enterprise Associates** and **Automatic Data Processing.**

CareerBuilder, beyond posting jobs offered by hundreds of employers, allows job seekers to submit a profile of their employment preferences. When a job matching the profile pops up, CareerBuilder sends e-mail to the applicant.

Like other Web job site companies such as **Monster Board** and **Online Career Center,** CareerBuilder makes its money selling "e-cruiting" software and services to employers, including a network of 17 other Internet recruitment sites.

Your best Internet- and intranet-related news, yes. Stained dresses and subpoenas, no. Contact Chris Nerney at (508) 820-7451 or cnerney@nww.com.

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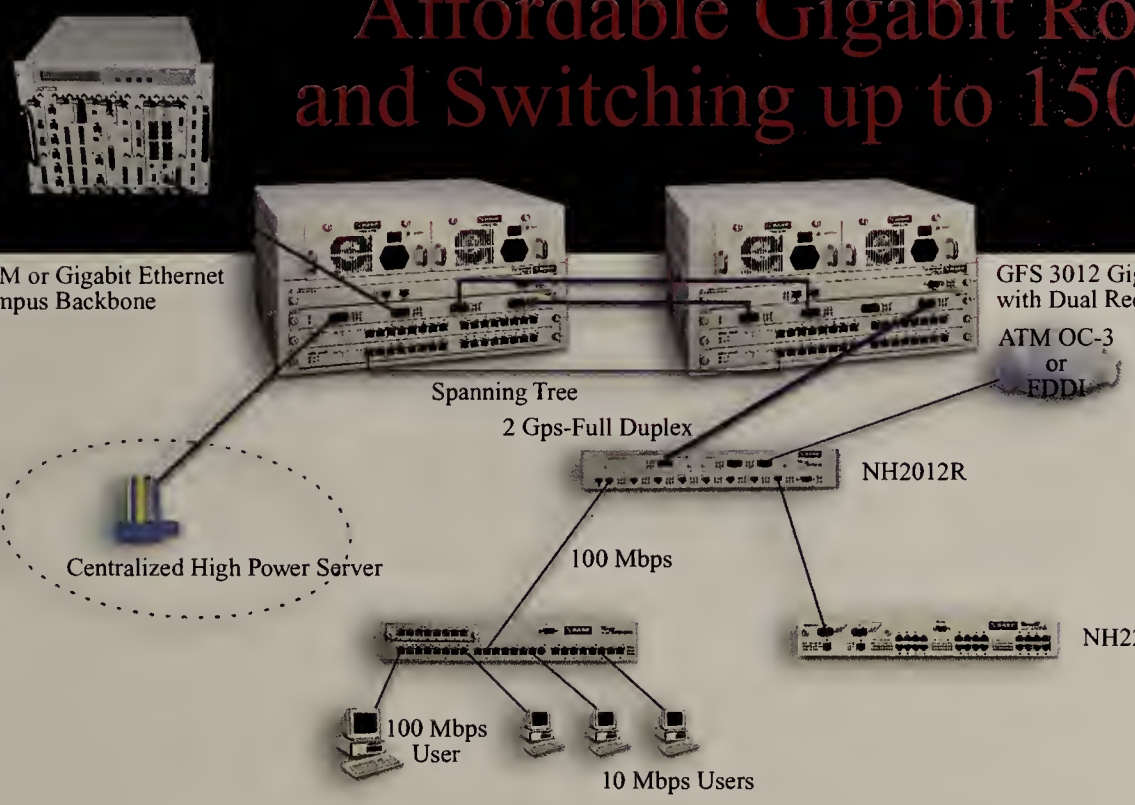

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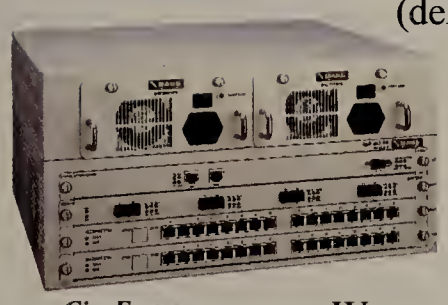

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